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#11

SEQUENCE LISTING

<110> International Flower Developments Pty Ltd

<120> Genetic sequences encoding flavonoid pathway enzymes
and uses therefor

<130> 2088133

<140> 09/142108
<141> 1997-02-28

<150> PN8386
<151> 1996-03-01

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<170> PatentIn Ver. 2.1

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<221> CDS
<222> (50)..(1588)

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att ctt aga tca ttt ttc cgt aaa cgt tac cct tta cca tta cca cca 154
Ile Leu Arg Ser Phe Phe Arg Lys Arg Tyr Pro Leu Pro Leu Pro Pro
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Gly Pro Lys Pro Trp Pro Ile Ile Gly Asn Leu Val His Leu Gly Pro
40 45 50

aaa cca cat caa tca act gca gcc atg gct caa act tat gga cca ctc 250
Lys Pro His Gln Ser Thr Ala Ala Met Ala Gln Thr Tyr Gly Pro Leu
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Met Tyr Leu Lys Met Gly Phe Val Asp Val Val Val Ala Ala Ser Ala
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tcg gtt gca gct cag ttc ttg aaa act cat gat gct aat ttc tcg agc   346
Ser Val Ala Ala Gln Phe Leu Lys Thr His Asp Ala Asn Phe Ser Ser
     85                  90                  95

cgt cca cca aat tct ggt gca gaa cat atg gct tat aat tat cag gat   394
Arg Pro Pro Asn Ser Gly Ala Glu His Met Ala Tyr Asn Tyr Gln Asp
100                 105                 110                 115

ctt gtt ttt gca cct tat gga cct aga tgg cgt atg ctt agg aaa att   442
Leu Val Phe Ala Pro Tyr Gly Pro Arg Trp Arg Met Leu Arg Lys Ile
                120                 125                 130

tgc tca gtt cac ctt ttc tct acc aag gct tta gat gac ttc cgc cat   490
Cys Ser Val His Leu Phe Ser Thr Lys Ala Leu Asp Asp Phe Arg His
            135                 140                 145

gtc cgc cag gat gaa gtg aaa aca ctg acg cgc gca cta gca agt gca   538
Val Arg Gln Asp Glu Val Lys Thr Leu Thr Arg Ala Leu Ala Ser Ala
        150                 155                 160

ggc caa aag cca gtc aaa tta ggt cag tta ttg aac gtg tgc acg acg   586
Gly Gln Lys Pro Val Lys Leu Gly Gln Leu Leu Asn Val Cys Thr Thr
    165                 170                 175

aac gca ctc gcg cga gta atg cta ggt aag cga gta ttt gcc gac gga   634
Asn Ala Leu Ala Arg Val Met Leu Gly Lys Arg Val Phe Ala Asp Gly
180                 185                 190                 195

agt ggc gat gtt gat cca caa gcg gcg gag ttc aag tca atg gtg gtg   682
Ser Gly Asp Val Asp Pro Gln Ala Ala Glu Phe Lys Ser Met Val Val
                200                 205                 210

gaa atg atg gta gtc gcc ggt gtt ttt aac att ggt gat ttt att ccg   730
Glu Met Met Val Val Ala Gly Val Phe Asn Ile Gly Asp Phe Ile Pro
            215                 220                 225

caa ctt aat tgg tta gat att caa ggt gta gcc gct aaa atg aag aag   778
Gln Leu Asn Trp Leu Asp Ile Gln Gly Val Ala Ala Lys Met Lys Lys
        230                 235                 240

ctc cac gcg cgt ttc gac gcg ttc ttg act gat ata ctt gaa gag cat   826
Leu His Ala Arg Phe Asp Ala Phe Leu Thr Asp Ile Leu Glu Glu His
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aag ggt aaa att ttt gga gaa atg aaa gat ttg ttg agt act ttg atc   874
Lys Gly Lys Ile Phe Gly Glu Met Lys Asp Leu Leu Ser Thr Leu Ile
260                 265                 270                 275
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tct ctt aaa aat gat gat gcg gat aat gat gga ggg aaa ctc act gat   922
Ser Leu Lys Asn Asp Asp Ala Asp Asn Asp Gly Gly Lys Leu Thr Asp
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aca gaa att aaa gca tta ctt ttg aac ttg ttt gta gct gga aca gac   970
Thr Glu Ile Lys Ala Leu Leu Leu Asn Leu Phe Val Ala Gly Thr Asp
            295                 300                 305

aca tct tct agt aca gtt gaa tgg gcc att gct gag ctt att cgt aat   1018
Thr Ser Ser Ser Thr Val Glu Trp Ala Ile Ala Glu Leu Ile Arg Asn
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cca aaa ata cta gcc caa gcc cag caa gag atc gac aaa gtc gtt gga   1066
Pro Lys Ile Leu Ala Gln Ala Gln Gln Glu Ile Asp Lys Val Val Gly
    325                 330                 335

agg gac cgg cta gtt ggc gaa ttg gac cta gcc caa ttg aca tac ttg   1114
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340                 345                 350                 355

gaa gct ata gtc aag gaa acc ttt cgg ctt cat cca tca acc cct ctt   1162
Glu Ala Ile Val Lys Glu Thr Phe Arg Leu His Pro Ser Thr Pro Leu
                360                 365                 370

tca ctt cct aga att gca tct gag agt tgt gag atc aat ggc tat ttc   1210
Ser Leu Pro Arg Ile Ala Ser Glu Ser Cys Glu Ile Asn Gly Tyr Phe
            375                 380                 385

att cca aaa ggc tca acg ctt ctc ctt aat gtt tgg gcc att gct cgt   1258
Ile Pro Lys Gly Ser Thr Leu Leu Leu Asn Val Trp Ala Ile Ala Arg
        390                 395                 400

gat cca aat gca tgg gct gat cca ttg gag ttt agg cct gaa agg ttt   1306
Asp Pro Asn Ala Trp Ala Asp Pro Leu Glu Phe Arg Pro Glu Arg Phe
    405                 410                 415

ttg cca gga ggt gag aag ccc aaa gtt gat gtc cgt ggg aat gac ttt   1354
Leu Pro Gly Gly Glu Lys Pro Lys Val Asp Val Arg Gly Asn Asp Phe
420                 425                 430                 435

gaa gtc ata cca ttt gga gct gga cgt agg att tgt gct gga atg aat   1402
Glu Val Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Met Asn
                440                 445                 450

ttg ggt ata cgt atg gtc cag ttg atg att gca act tta ata cat gca   1450
Leu Gly Ile Arg Met Val Gln Leu Met Ile Ala Thr Leu Ile His Ala
            455                 460                 465

ttt aac tgg gat ttg gtc agt gga caa ttg ccg gag atg ttg aat atg   1498
Phe Asn Trp Asp Leu Val Ser Gly Gln Leu Pro Glu Met Leu Asn Met
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gaa gaa gca tat ggg ctg acc tta caa cgg gct gat cca ttg gtt gtg   1546
Glu Glu Ala Tyr Gly Leu Thr Leu Gln Arg Ala Asp Pro Leu Val Val
    485                 490                 495

cac cca agg cct cgc tta gaa gcc caa gcg tac att ggg tga          1588
His Pro Arg Pro Arg Leu Glu Ala Gln Ala Tyr Ile Gly
500                 505                 510

gcagcaacag cccatggaga taacatgagt gttaaatgta tgagtctcca tatcttgttt 1648

agtttgttta tgctttggat ttagtagttt ttatattgat agatcaatgt ttgcattgtc 1708

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             20                  25                  30
Leu Pro Pro Gly Pro Lys Pro Trp Pro Ile Ile Gly Asn Leu Val His
         35                  40                  45
Leu Gly Pro Lys Pro His Gln Ser Thr Ala Ala Met Ala Gln Thr Tyr
     50                  55                  60
Gly Pro Leu Met Tyr Leu Lys Met Gly Phe Val Asp Val Val Val Ala
 65                  70                  75                  80
Ala Ser Ala Ser Val Ala Ala Gln Phe Leu Lys Thr His Asp Ala Asn
                 85                  90                  95
Phe Ser Ser Arg Pro Pro Asn Ser Gly Ala Glu His Met Ala Tyr Asn
            100                 105                 110
Tyr Gln Asp Leu Val Phe Ala Pro Tyr Gly Pro Arg Trp Arg Met Leu
        115                 120                 125
Arg Lys Ile Cys Ser Val His Leu Phe Ser Thr Lys Ala Leu Asp Asp
    130                 135                 140
Phe Arg His Val Arg Gln Asp Glu Val Lys Thr Leu Thr Arg Ala Leu
145                 150                 155                 160
Ala Ser Ala Gly Gln Lys Pro Val Lys Leu Gly Gln Leu Leu Asn Val
                165                 170                 175
Cys Thr Thr Asn Ala Leu Ala Arg Val Met Leu Gly Lys Arg Val Phe
            180                 185                 190
Ala Asp Gly Ser Gly Asp Val Asp Pro Gln Ala Ala Glu Phe Lys Ser
        195                 200                 205
Met Val Val Glu Met Met Val Val Ala Gly Val Phe Asn Ile Gly Asp
    210                 215                 220
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Phe Ile Pro Gln Leu Asn Trp Leu Asp Ile Gln Gly Val Ala Ala Lys
225                 230                 235                 240
Met Lys Lys Leu His Ala Arg Phe Asp Ala Phe Leu Thr Asp Ile Leu
                245                 250                 255
Glu Glu His Lys Gly Lys Ile Phe Gly Glu Met Lys Asp Leu Leu Ser
            260                 265                 270
Thr Leu Ile Ser Leu Lys Asn Asp Asp Ala Asp Asn Asp Gly Gly Lys
        275                 280                 285
Leu Thr Asp Thr Glu Ile Lys Ala Leu Leu Leu Asn Leu Phe Val Ala
    290                 295                 300
Gly Thr Asp Thr Ser Ser Ser Thr Val Glu Trp Ala Ile Ala Glu Leu
305                 310                 315                 320
Ile Arg Asn Pro Lys Ile Leu Ala Gln Ala Gln Gln Glu Ile Asp Lys
                325                 330                 335
Val Val Gly Arg Asp Arg Leu Val Gly Glu Leu Asp Leu Ala Gln Leu
            340                 345                 350
Thr Tyr Leu Glu Ala Ile Val Lys Glu Thr Phe Arg Leu His Pro Ser
        355                 360                 365
Thr Pro Leu Ser Leu Pro Arg Ile Ala Ser Glu Ser Cys Glu Ile Asn
    370                 375                 380
Gly Tyr Phe Ile Pro Lys Gly Ser Thr Leu Leu Leu Asn Val Trp Ala
385                 390                 395                 400
Ile Ala Arg Asp Pro Asn Ala Trp Ala Asp Pro Leu Glu Phe Arg Pro
                405                 410                 415
Glu Arg Phe Leu Pro Gly Gly Glu Lys Pro Lys Val Asp Val Arg Gly
            420                 425                 430
Asn Asp Phe Glu Val Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala
        435                 440                 445
Gly Met Asn Leu Gly Ile Arg Met Val Gln Leu Met Ile Ala Thr Leu
    450                 455                 460
Ile His Ala Phe Asn Trp Asp Leu Val Ser Gly Gln Leu Pro Glu Met
465                 470                 475                 480
Leu Asn Met Glu Glu Ala Tyr Gly Leu Thr Leu Gln Arg Ala Asp Pro
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aaaaaaaatt ataatgtcac ccttagaggt aactttctac accatagtcc t atg cac  177
                                                        Met His
                                                          1

aat ctc tac tac ctc atc acc acc gtc ttc cgc ggc cac caa aaa ccg   225
Asn Leu Tyr Tyr Leu Ile Thr Thr Val Phe Arg Gly His Gln Lys Pro
          5                  10                  15

ctt cct cca ggg cca cga cca tgg ccc atc gtg gga aac ctc cca cat   273
Leu Pro Pro Gly Pro Arg Pro Trp Pro Ile Val Gly Asn Leu Pro His
     20                  25                  30

atg ggc cag gca ccg cac cag ggc tta gca gcc ctg gcg caa aag tat   321
Met Gly Gln Ala Pro His Gln Gly Leu Ala Ala Leu Ala Gln Lys Tyr
 35                  40                  45                  50

ggc cct cta ttg tat atg aga ctg ggg tac gtg gac gtt gtt gtg gcc   369
Gly Pro Leu Leu Tyr Met Arg Leu Gly Tyr Val Asp Val Val Val Ala
                 55                  60                  65

gcc tca gcg tct gta gcg acc cag ttt ctt aag aca cat gac cta aat   417
Ala Ser Ala Ser Val Ala Thr Gln Phe Leu Lys Thr His Asp Leu Asn
             70                  75                  80

ttt tcg agt agg cca ccg aat tcg ggg gct aaa cac att gct tat aac   465
Phe Ser Ser Arg Pro Pro Asn Ser Gly Ala Lys His Ile Ala Tyr Asn
         85                  90                  95

tat caa gac ctt gtt ttt gca cct tat gga cct aaa tgg cgc atg ctt   513
Tyr Gln Asp Leu Val Phe Ala Pro Tyr Gly Pro Lys Trp Arg Met Leu
    100                 105                 110

agg aaa att tgt tcc tta cac atg ttt tct tct aag gct ttg gac gat   561
Arg Lys Ile Cys Ser Leu His Met Phe Ser Ser Lys Ala Leu Asp Asp
115                 120                 125                 130

ttt aga ctt gtc cgt cag gaa gaa gta tct ata ctg gta aat gcg ata   609
Phe Arg Leu Val Arg Gln Glu Glu Val Ser Ile Leu Val Asn Ala Ile
                135                 140                 145

gca aaa gca gga aca aag cca gta caa cta gga caa cta ctc aac gtg   657
Ala Lys Ala Gly Thr Lys Pro Val Gln Leu Gly Gln Leu Leu Asn Val
            150                 155                 160

tgc acc aca aat gcc tta tcg agg gtg atg cta ggg aag cga gtt ctc   705
Cys Thr Thr Asn Ala Leu Ser Arg Val Met Leu Gly Lys Arg Val Leu
        165                 170                 175

ggt gat ggc aca ggg aaa agc gac cca aaa gcc gag gaa ttt aag gac   753
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Gly Asp Gly Thr Gly Lys Ser Asp Pro Lys Ala Glu Glu Phe Lys Asp
    180                 185                 190

atg gtg ctg gag tta atg gtt ctc acc gga gtt ttt aac att ggc gat   801
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195                 200                 205                 210

ttt gta ccg gca ttg gaa tgt cta gac tta caa ggt gtt gca tct aaa   849
Phe Val Pro Ala Leu Glu Cys Leu Asp Leu Gln Gly Val Ala Ser Lys
                215                 220                 225

atg aag aaa tta cat aaa aga ctt gat aat ttt atg agt aac att ttg   897
Met Lys Lys Leu His Lys Arg Leu Asp Asn Phe Met Ser Asn Ile Leu
            230                 235                 240

gag gaa cac aag agt gtt gca cat caa caa aat ggt gga gat ttg cta   945
Glu Glu His Lys Ser Val Ala His Gln Gln Asn Gly Gly Asp Leu Leu
        245                 250                 255

agc att ttg ata tct ttg aag gat aat tgt gat ggt gaa ggt ggc aag   993
Ser Ile Leu Ile Ser Leu Lys Asp Asn Cys Asp Gly Glu Gly Gly Lys
    260                 265                 270

ttt agt gcc aca gaa att aag gcc ttg cta ttg gat tta ttt aca gct   1041
Phe Ser Ala Thr Glu Ile Lys Ala Leu Leu Leu Asp Leu Phe Thr Ala
275                 280                 285                 290

gga aca gac aca tca tct agt aca act gaa tgg gcc ata gcc gaa cta   1089
Gly Thr Asp Thr Ser Ser Ser Thr Thr Glu Trp Ala Ile Ala Glu Leu
                295                 300                 305

att cgc cat cca aaa atc tta gcc caa gtt caa caa gaa atg gac tca   1137
Ile Arg His Pro Lys Ile Leu Ala Gln Val Gln Gln Glu Met Asp Ser
            310                 315                 320

gtc gtg ggc cga gac cga ctc ata gcc gaa gct gac ata ccg aac cta   1185
Val Val Gly Arg Asp Arg Leu Ile Ala Glu Ala Asp Ile Pro Asn Leu
        325                 330                 335

acc tac ttc caa gcc gta atc aaa gag gtt ttc cga ctt cac ccg tcc   1233
Thr Tyr Phe Gln Ala Val Ile Lys Glu Val Phe Arg Leu His Pro Ser
    340                 345                 350

acc ccg ctt tcc cta cca cgg gtc gca aac gaa tcg tgc gaa ata aac   1281
Thr Pro Leu Ser Leu Pro Arg Val Ala Asn Glu Ser Cys Glu Ile Asn
355                 360                 365                 370

ggg tac cac att ccc aaa aac acc act tta ttg gta aat gtg tgg gcc   1329
Gly Tyr His Ile Pro Lys Asn Thr Thr Leu Leu Val Asn Val Trp Ala
                375                 380                 385

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Glu Arg Phe Leu Pro Gly Gly Glu Lys Pro Asn Val Asp Val Lys Gly
        405                 410                 415

aac gat ttt gag ctg att ccg ttc ggg gcg ggc cga cgg att tgt gct   1473
Asn Asp Phe Glu Leu Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala
    420                 425                 430

ggg ctg agt ttg ggc ctg cgt atg gtc cag ttg atg aca gcc act ttg   1521
Gly Leu Ser Leu Gly Leu Arg Met Val Gln Leu Met Thr Ala Thr Leu
435                 440                 445                 450

gcc cat act tat gat tgg gcc tta gct gat ggg ctt atg ccc gaa aag   1569
Ala His Thr Tyr Asp Trp Ala Leu Ala Asp Gly Leu Met Pro Glu Lys
                455                 460                 465

ctt aac atg gat gag gct tat ggg ctt acc tta cag cgt aag gtg cca   1617
Leu Asn Met Asp Glu Ala Tyr Gly Leu Thr Leu Gln Arg Lys Val Pro
            470                 475                 480

ctt aat ggt cca ccc gac ccc gtc ggc ttc tcg gcc cgt gtt taa       1662
Leu Asn Gly Pro Pro Asp Pro Val Gly Phe Ser Ala Arg Val
        485                 490                 495

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aaaataatgg tattagagaa atg                                         1745


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<213> Dianthus caryophyllus

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Pro His Met Gly Gln Ala Pro His Gln Gly Leu Ala Ala Leu Ala Gln
         35                  40                  45
Lys Tyr Gly Pro Leu Leu Tyr Met Arg Leu Gly Tyr Val Asp Val Val
     50                  55                  60
Val Ala Ala Ser Ala Ser Val Ala Thr Gln Phe Leu Lys Thr His Asp
 65                  70                  75                  80
Leu Asn Phe Ser Ser Arg Pro Pro Asn Ser Gly Ala Lys His Ile Ala
                 85                  90                  95
Tyr Asn Tyr Gln Asp Leu Val Phe Ala Pro Tyr Gly Pro Lys Trp Arg
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Met Leu Arg Lys Ile Cys Ser Leu His Met Phe Ser Ser Lys Ala Leu
        115                 120                 125
Asp Asp Phe Arg Leu Val Arg Gln Glu Glu Val Ser Ile Leu Val Asn
    130                 135                 140
Ala Ile Ala Lys Ala Gly Thr Lys Pro Val Gln Leu Gly Gln Leu Leu
145                 150                 155                 160
Asn Val Cys Thr Thr Asn Ala Leu Ser Arg Val Met Leu Gly Lys Arg
                165                 170                 175
Val Leu Gly Asp Gly Thr Gly Lys Ser Asp Pro Lys Ala Glu Glu Phe
            180                 185                 190
Lys Asp Met Val Leu Glu Leu Met Val Leu Thr Gly Val Phe Asn Ile
        195                 200                 205
Gly Asp Phe Val Pro Ala Leu Glu Cys Leu Asp Leu Gln Gly Val Ala
    210                 215                 220
Ser Lys Met Lys Lys Leu His Lys Arg Leu Asp Asn Phe Met Ser Asn
225                 230                 235                 240
Ile Leu Glu Glu His Lys Ser Val Ala His Gln Gln Asn Gly Gly Asp
                245                 250                 255
Leu Leu Ser Ile Leu Ile Ser Leu Lys Asp Asn Cys Asp Gly Glu Gly
            260                 265                 270
Gly Lys Phe Ser Ala Thr Glu Ile Lys Ala Leu Leu Leu Asp Leu Phe
        275                 280                 285
Thr Ala Gly Thr Asp Thr Ser Ser Ser Thr Thr Glu Trp Ala Ile Ala
    290                 295                 300
Glu Leu Ile Arg His Pro Lys Ile Leu Ala Gln Val Gln Gln Glu Met
305                 310                 315                 320
Asp Ser Val Val Gly Arg Asp Arg Leu Ile Ala Glu Ala Asp Ile Pro
                325                 330                 335
Asn Leu Thr Tyr Phe Gln Ala Val Ile Lys Glu Val Phe Arg Leu His
            340                 345                 350
Pro Ser Thr Pro Leu Ser Leu Pro Arg Val Ala Asn Glu Ser Cys Glu
        355                 360                 365
Ile Asn Gly Tyr His Ile Pro Lys Asn Thr Thr Leu Leu Val Asn Val
    370                 375                 380
Trp Ala Ile Ala Arg Asp Pro Glu Val Trp Ala Asp Pro Leu Glu Phe
385                 390                 395                 400
Lys Pro Glu Arg Phe Leu Pro Gly Gly Glu Lys Pro Asn Val Asp Val
                405                 410                 415
Lys Gly Asn Asp Phe Glu Leu Ile Pro Phe Gly Ala Gly Arg Arg Ile
            420                 425                 430
Cys Ala Gly Leu Ser Leu Gly Leu Arg Met Val Gln Leu Met Thr Ala
        435                 440                 445
Thr Leu Ala His Thr Tyr Asp Trp Ala Leu Ala Asp Gly Leu Met Pro
    450                 455                 460
Glu Lys Leu Asn Met Asp Glu Ala Tyr Gly Leu Thr Leu Gln Arg Lys
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Val Pro Leu Asn Gly Pro Pro Asp Pro Val Gly Phe Ser Ala Arg Val
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Met Gln His Gln Tyr Tyr Ser Leu
1 5

att acg atg gat gat att agc ata acc agc tta ttg gtg cca tgt act 162
Ile Thr Met Asp Asp Ile Ser Ile Thr Ser Leu Leu Val Pro Cys Thr
10 15 20

ttt ata tta ggg ttc ttg ctt cta tat tcc ttc ctc aac aaa aaa gta 210
Phe Ile Leu Gly Phe Leu Leu Leu Tyr Ser Phe Leu Asn Lys Lys Val
25 30 35 40

aag cca ctg cca cct gga ccg aag cca tgg ccc atc gtc gga aat ctg 258
Lys Pro Leu Pro Pro Gly Pro Lys Pro Trp Pro Ile Val Gly Asn Leu
45 50 55

cca cat ctt ggg ccg aag ccc cac cag tcg atg gcg gcg ctg gca cgg 306
Pro His Leu Gly Pro Lys Pro His Gln Ser Met Ala Ala Leu Ala Arg
60 65 70

gtg cac ggc cca tta att cat ctg aag atg ggc ttt gtg cat gtg gtt 354
Val His Gly Pro Leu Ile His Leu Lys Met Gly Phe Val His Val Val
75 80 85

gtg gcc tcc tca gca tcc gtt gcg gag aaa ttt ctg aag gtg cat gac 402
Val Ala Ser Ser Ala Ser Val Ala Glu Lys Phe Leu Lys Val His Asp
90 95 100

gca aac ttc tcg agc agg cct ccc aat tcg ggt gca aaa cac gtg gcc 450
Ala Asn Phe Ser Ser Arg Pro Pro Asn Ser Gly Ala Lys His Val Ala
105 110 115 120

tac aac tat cag gac ttg gtc ttt gct cct tat ggc cca cgc tgg cgg 498
Tyr Asn Tyr Gln Asp Leu Val Phe Ala Pro Tyr Gly Pro Arg Trp Arg
125 130 135

atg ctc agg aaa atc tgt gca ctc cac ctc ttc tcc gcc aaa gcc ttg 546
Met Leu Arg Lys Ile Cys Ala Leu His Leu Phe Ser Ala Lys Ala Leu
140 145 150

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aac gac ttc aca cac gtc aga cag gat gag gtg ggg atc ctc act cgc   594
Asn Asp Phe Thr His Val Arg Gln Asp Glu Val Gly Ile Leu Thr Arg
        155                 160                 165

gtt cta gca gat gca gga gaa acg ccg ttg aaa tta ggg cag atg atg   642
Val Leu Ala Asp Ala Gly Glu Thr Pro Leu Lys Leu Gly Gln Met Met
    170                 175                 180

aac aca tgc gcc acc aat gca ata gcg cgt gtt atg ttg ggt cga cgc   690
Asn Thr Cys Ala Thr Asn Ala Ile Ala Arg Val Met Leu Gly Arg Arg
185                 190                 195                 200

gtg gtt gga cac gca gac tca aag gcg gag gag ttt aag gca atg gta   738
Val Val Gly His Ala Asp Ser Lys Ala Glu Glu Phe Lys Ala Met Val
                205                 210                 215

gtg gag ttg atg gta tta gct ggt gtg ttc aac tta ggt gat ttt atc   786
Val Glu Leu Met Val Leu Ala Gly Val Phe Asn Leu Gly Asp Phe Ile
            220                 225                 230

cca cct ctt gaa aaa ttg gat ctt caa ggt gtc att gct aag atg aag   834
Pro Pro Leu Glu Lys Leu Asp Leu Gln Gly Val Ile Ala Lys Met Lys
        235                 240                 245

aag ctt cac ttg cgt ttc gac tcg ttc ttg agt aag atc ctt gga gac   882
Lys Leu His Leu Arg Phe Asp Ser Phe Leu Ser Lys Ile Leu Gly Asp
    250                 255                 260

cac aag atc aac agc tca gat gaa acc aaa ggc cat tcg gat ttg ttg   930
His Lys Ile Asn Ser Ser Asp Glu Thr Lys Gly His Ser Asp Leu Leu
265                 270                 275                 280

aac atg tta att tct ttg aag gac gct gat gat gcc gaa gga ggg agg   978
Asn Met Leu Ile Ser Leu Lys Asp Ala Asp Asp Ala Glu Gly Gly Arg
                285                 290                 295

ctc acc gac gta gaa att aaa gcg ttg ctc ttg aac ttg ttt gct gca  1026
Leu Thr Asp Val Glu Ile Lys Ala Leu Leu Leu Asn Leu Phe Ala Ala
            300                 305                 310

gga act gac aca aca tca agc act gtg gaa tgg tgc ata gct gag tta  1074
Gly Thr Asp Thr Thr Ser Ser Thr Val Glu Trp Cys Ile Ala Glu Leu
        315                 320                 325

gta cga cat cct gaa atc ctt gcc caa gtc caa aaa gaa ctc gac tct  1122
Val Arg His Pro Glu Ile Leu Ala Gln Val Gln Lys Glu Leu Asp Ser
    330                 335                 340

gtt gtt ggt aag aat cgg gtg gtg aag gag gct gat ctg gcc gga tta  1170
Val Val Gly Lys Asn Arg Val Val Lys Glu Ala Asp Leu Ala Gly Leu
345                 350                 355                 360
```

```
cca ttc ctc caa gcg gtc gtc aag gaa aat ttc cga ctc cat ccc tcc   1218
Pro Phe Leu Gln Ala Val Val Lys Glu Asn Phe Arg Leu His Pro Ser
                365                 370                 375

acc ccg ctc tcc cta ccg agg atc gca cat gag agt tgt gaa gtg aat   1266
Thr Pro Leu Ser Leu Pro Arg Ile Ala His Glu Ser Cys Glu Val Asn
            380                 385                 390

gga tac ttg att cca aag ggt tcg aca ctt ctt gtc aat gtt tgg gca   1314
Gly Tyr Leu Ile Pro Lys Gly Ser Thr Leu Leu Val Asn Val Trp Ala
        395                 400                 405

att gct cgc gat cca aat gtg tgg gat gaa cca cta gag ttc cgg cct   1362
Ile Ala Arg Asp Pro Asn Val Trp Asp Glu Pro Leu Glu Phe Arg Pro
    410                 415                 420

gaa cga ttc ttg aag ggc ggg gaa aag cct aat gtc gat gtt aga ggg   1410
Glu Arg Phe Leu Lys Gly Gly Glu Lys Pro Asn Val Asp Val Arg Gly
425                 430                 435                 440

aat gat ttc gaa ttg ata ccg ttc gga gcg ggc cga aga att tgt gca   1458
Asn Asp Phe Glu Leu Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala
                445                 450                 455

gga atg agc tta gga ata cgt atg gtc cag ttg ttg aca gca act ttg   1506
Gly Met Ser Leu Gly Ile Arg Met Val Gln Leu Leu Thr Ala Thr Leu
            460                 465                 470

aac cat gcg ttt gac ttt gat ttg gcg gat gga cag ttg cct gaa agc   1554
Asn His Ala Phe Asp Phe Asp Leu Ala Asp Gly Gln Leu Pro Glu Ser
        475                 480                 485

tta aac atg gag gaa gct tat ggg ctg acc ttg caa cga gct gac cct   1602
Leu Asn Met Glu Glu Ala Tyr Gly Leu Thr Leu Gln Arg Ala Asp Pro
    490                 495                 500

ttg gta gtg cac ccg aag cct agg tag gcacctcatg tttatcaaac         1649
Leu Val Val His Pro Lys Pro Arg
505                 510

ttaggactca tgtttagaga acctcttgtt gttttatcag attgaagtgt gatgtccaag 1709

ac                                                                1711
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<210> 6
<211> 512
<212> PRT
<213> Antirrhinum majus

<400> 6

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Met Gln His Gln Tyr Tyr Ser Leu Ile Thr Met Asp Asp Ile Ser Ile
 1               5                  10                  15
Thr Ser Leu Leu Val Pro Cys Thr Phe Ile Leu Gly Phe Leu Leu Leu
            20                  25                  30
Tyr Ser Phe Leu Asn Lys Lys Val Lys Pro Leu Pro Pro Gly Pro Lys
        35                  40                  45
Pro Trp Pro Ile Val Gly Asn Leu Pro His Leu Gly Pro Lys Pro His
    50                  55                  60
Gln Ser Met Ala Ala Leu Ala Arg Val His Gly Pro Leu Ile His Leu
65                  70                  75                  80
Lys Met Gly Phe Val His Val Val Val Ala Ser Ser Ala Ser Val Ala
                85                  90                  95
Glu Lys Phe Leu Lys Val His Asp Ala Asn Phe Ser Ser Arg Pro Pro
            100                 105                 110
Asn Ser Gly Ala Lys His Val Ala Tyr Asn Tyr Gln Asp Leu Val Phe
        115                 120                 125
Ala Pro Tyr Gly Pro Arg Trp Arg Met Leu Arg Lys Ile Cys Ala Leu
    130                 135                 140
His Leu Phe Ser Ala Lys Ala Leu Asn Asp Phe Thr His Val Arg Gln
145                 150                 155                 160
Asp Glu Val Gly Ile Leu Thr Arg Val Leu Ala Asp Ala Gly Glu Thr
                165                 170                 175
Pro Leu Lys Leu Gly Gln Met Met Asn Thr Cys Ala Thr Asn Ala Ile
            180                 185                 190
Ala Arg Val Met Leu Gly Arg Arg Val Val Gly His Ala Asp Ser Lys
        195                 200                 205
Ala Glu Glu Phe Lys Ala Met Val Val Glu Leu Met Val Leu Ala Gly
    210                 215                 220
Val Phe Asn Leu Gly Asp Phe Ile Pro Pro Leu Glu Lys Leu Asp Leu
225                 230                 235                 240
Gln Gly Val Ile Ala Lys Met Lys Lys Leu His Leu Arg Phe Asp Ser
                245                 250                 255
Phe Leu Ser Lys Ile Leu Gly Asp His Lys Ile Asn Ser Ser Asp Glu
            260                 265                 270
Thr Lys Gly His Ser Asp Leu Leu Asn Met Leu Ile Ser Leu Lys Asp
        275                 280                 285
Ala Asp Asp Ala Glu Gly Gly Arg Leu Thr Asp Val Glu Ile Lys Ala
    290                 295                 300
Leu Leu Leu Asn Leu Phe Ala Ala Gly Thr Asp Thr Thr Ser Ser Thr
305                 310                 315                 320
Val Glu Trp Cys Ile Ala Glu Leu Val Arg His Pro Glu Ile Leu Ala
                325                 330                 335
Gln Val Gln Lys Glu Leu Asp Ser Val Val Gly Lys Asn Arg Val Val
            340                 345                 350
Lys Glu Ala Asp Leu Ala Gly Leu Pro Phe Leu Gln Ala Val Val Lys
        355                 360                 365
Glu Asn Phe Arg Leu His Pro Ser Thr Pro Leu Ser Leu Pro Arg Ile
    370                 375                 380
Ala His Glu Ser Cys Glu Val Asn Gly Tyr Leu Ile Pro Lys Gly Ser
385                 390                 395                 400
Thr Leu Leu Val Asn Val Trp Ala Ile Ala Arg Asp Pro Asn Val Trp
                405                 410                 415
```

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Asp Glu Pro Leu Glu Phe Arg Pro Glu Arg Phe Leu Lys Gly Gly Glu
            420                 425                 430
Lys Pro Asn Val Asp Val Arg Gly Asn Asp Phe Glu Leu Ile Pro Phe
        435                 440                 445
Gly Ala Gly Arg Arg Ile Cys Ala Gly Met Ser Leu Gly Ile Arg Met
    450                 455                 460
Val Gln Leu Leu Thr Ala Thr Leu Asn His Ala Phe Asp Phe Asp Leu
465                 470                 475                 480
Ala Asp Gly Gln Leu Pro Glu Ser Leu Asn Met Glu Glu Ala Tyr Gly
                485                 490                 495
Leu Thr Leu Gln Arg Ala Asp Pro Leu Val Val His Pro Lys Pro Arg
            500                 505                 510
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<210> 7
<211> 971
<212> DNA
<213> Arabidopsis thaliana

<220>
<221> CDS
<222> (1)..(813)

<400> 7

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Asp Met Leu Ser Thr Leu Ile Ser Leu Lys Gly Thr Asp Leu Asp Gly
  1               5                  10                  15

gac gga gga agc tta acg gat act gag att aaa gcc ttg cta ttg aac   96
Asp Gly Gly Ser Leu Thr Asp Thr Glu Ile Lys Ala Leu Leu Leu Asn
             20                  25                  30

atg ttc aca gct gga act gac acg tca gca agt acg gtg gac tgg gct   144
Met Phe Thr Ala Gly Thr Asp Thr Ser Ala Ser Thr Val Asp Trp Ala
         35                  40                  45

ata gct gaa ctt atc cgt cac ccg gat ata atg gtt aaa gcc caa gaa   192
Ile Ala Glu Leu Ile Arg His Pro Asp Ile Met Val Lys Ala Gln Glu
     50                  55                  60

gaa ctt gat att gtt gtg ggc cgt gac agg cct gtt aat gaa tca gac   240
Glu Leu Asp Ile Val Val Gly Arg Asp Arg Pro Val Asn Glu Ser Asp
 65                  70                  75                  80

atc gct cag ctt cct tac ctt cag gcg gtt atc aaa gag aat ttc agg   288
Ile Ala Gln Leu Pro Tyr Leu Gln Ala Val Ile Lys Glu Asn Phe Arg
                 85                  90                  95

ctt cat cca cca aca cca ctc tcg tta cca cac atc gcg tca gag agc   336
Leu His Pro Pro Thr Pro Leu Ser Leu Pro His Ile Ala Ser Glu Ser
            100                 105                 110
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```
tgt gag atc aac ggc tac cat atc ccg aaa gga tcg act cta ttt gac   384
Cys Glu Ile Asn Gly Tyr His Ile Pro Lys Gly Ser Thr Leu Phe Asp
        115                 120                 125

gga cat atg ggc cta ggc cgt gac ccg gat caa tgg tcc gac ccg tta   432
Gly His Met Gly Leu Gly Arg Asp Pro Asp Gln Trp Ser Asp Pro Leu
    130                 135                 140

gca ttt aaa ccc gag aga ttc tta ccc ggt ggt gaa aaa tcc ggc gtt   480
Ala Phe Lys Pro Glu Arg Phe Leu Pro Gly Gly Glu Lys Ser Gly Val
145                 150                 155                 160

gat gtg aaa gga agc gat ttc gag cta ata ccg ttc ggg gct ggg agg   528
Asp Val Lys Gly Ser Asp Phe Glu Leu Ile Pro Phe Gly Ala Gly Arg
                165                 170                 175

cca atc tgt gca ggt tta agt tta ggg cta cgt aca gat tta agt tgc   576
Pro Ile Cys Ala Gly Leu Ser Leu Gly Leu Arg Thr Asp Leu Ser Cys
            180                 185                 190

ctt cac gcc aac gtt gct cac aag cat ttg att ggg aac ttc agc tgg   624
Leu His Ala Asn Val Ala His Lys His Leu Ile Gly Asn Phe Ser Trp
        195                 200                 205

aga agt tac gcc gga caa cct gaa tat cgc agg aaa agt tta ctg ggc   672
Arg Ser Tyr Ala Gly Gln Pro Glu Tyr Arg Arg Lys Ser Leu Leu Gly
    210                 215                 220

ttt aca ctg caa aga gcg gtt cct tcg gtg gta cac cct aag cca agg   720
Phe Thr Leu Gln Arg Ala Val Pro Ser Val Val His Pro Lys Pro Arg
225                 230                 235                 240

ttg gcc ccg aac gtt tat gga ccc cgg gtc ggc tta aaa ttt aac ttt   768
Leu Ala Pro Asn Val Tyr Gly Pro Arg Val Gly Leu Lys Phe Asn Phe
                245                 250                 255

gct tct tgg aca agg tat atg gct tgc acg aaa cta acg ttt taa       813
Ala Ser Trp Thr Arg Tyr Met Ala Cys Thr Lys Leu Thr Phe
            260                 265                 270

cacaccgtag tttgatccgg agttagcttt atgtaagaac gtgtaacgcc aaatcaagcc 873

attatcaact accgtgagct gtttgtaccc tatctataaa tcttgaagag gaacatttca 933

gaactcttga ctatgtttca ggaacaaaaa aaaaaaaa                          971
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<210> 8
<211> 270
<212> PRT
<213> Arabidopsis thaliana

<400> 8

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  1               5                  10                  15
Asp Gly Gly Ser Leu Thr Asp Thr Glu Ile Lys Ala Leu Leu Leu Asn
             20                  25                  30
Met Phe Thr Ala Gly Thr Asp Thr Ser Ala Ser Thr Val Asp Trp Ala
         35                  40                  45
Ile Ala Glu Leu Ile Arg His Pro Asp Ile Met Val Lys Ala Gln Glu
     50                  55                  60
Glu Leu Asp Ile Val Val Gly Arg Asp Arg Pro Val Asn Glu Ser Asp
 65                  70                  75                  80
Ile Ala Gln Leu Pro Tyr Leu Gln Ala Val Ile Lys Glu Asn Phe Arg
                 85                  90                  95
Leu His Pro Pro Thr Pro Leu Ser Leu Pro His Ile Ala Ser Glu Ser
            100                 105                 110
Cys Glu Ile Asn Gly Tyr His Ile Pro Lys Gly Ser Thr Leu Phe Asp
        115                 120                 125
Gly His Met Gly Leu Gly Arg Asp Pro Asp Gln Trp Ser Asp Pro Leu
    130                 135                 140
Ala Phe Lys Pro Glu Arg Phe Leu Pro Gly Gly Glu Lys Ser Gly Val
145                 150                 155                 160
Asp Val Lys Gly Ser Asp Phe Glu Leu Ile Pro Phe Gly Ala Gly Arg
                165                 170                 175
Pro Ile Cys Ala Gly Leu Ser Leu Gly Leu Arg Thr Asp Leu Ser Cys
            180                 185                 190
Leu His Ala Asn Val Ala His Lys His Leu Ile Gly Asn Phe Ser Trp
        195                 200                 205
Arg Ser Tyr Ala Gly Gln Pro Glu Tyr Arg Arg Lys Ser Leu Leu Gly
    210                 215                 220
Phe Thr Leu Gln Arg Ala Val Pro Ser Val Val His Pro Lys Pro Arg
225                 230                 235                 240
Leu Ala Pro Asn Val Tyr Gly Pro Arg Val Gly Leu Lys Phe Asn Phe
                245                 250                 255
Ala Ser Trp Thr Arg Tyr Met Ala Cys Thr Lys Leu Thr Phe
            260                 265                 270
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<210> 9
<211> 6595
<212> DNA
<213> Arabidopsis thaliana

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<222> (1478)..(1927)

<220>
<221> CDS
<222> (2651)..(3091)

<220>

<221> CDS
<222> (3170)..(3340)

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<222> (3421)..(3907)

<400> 9
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gtgcacacat tcgtatgttt gaaacatggt aggatccaca atttatactt tatagactca 120

aaatggaaaa gaaacgtaca ttataaattt atctgcaatt tgttttctct tgctaaacta 180

gactgtataa taacctctgt atatgctatt actcgattgt aaacgtaccc cgcaagtcgc 240

aagcaaggta aataaagtat aattatattt tcacacacga aactttaatt attattttta 300

tcacttgcag attaacagta aaaaaaaaaa aaatgtgact ttaacggcga caaaaactac 360

tgatctttct ccaatattta aataatataa ttaataaacg tcttttcata cttgtatttt 420

ccgacccgag ttctgaaagt gaaaacatat ggtactagat attctcgatt tgttttgtag 480

ccactagact ctaaacagaa aaaagaagcc aaaaggacaa cgttaaaaaa gagacactgt 540

tattaaaagt tagaaaccaa acggtgaaaa tccagctaca tacataaaat aaagccaagg 600

taccaaacta atgaactgta acctcttttt tcttttcttt tttgttaaag gatttatgaa 660

ctgtaactta gaatgcttgg tttgtgggca gtgtaatata tgacacacat gcatttttt 720

tgtttgtcaa ataggaagac ttctttttc tttatcaact tccttatttt cataaaacaa 780

aacactgaaa aaagtacaga tgttctcacg tacgtcacgt gtacatacat atatattaga 840

ccactatata ataagatatg aagtgttagg tttaaatcaa ttaacgaatc ccatccaaat 900

gatgaaacag ttaacaagaa atcaaaatag tttattaggg ttacaatgat tttatacttt 960

taagaaatct tagaacctat cacttacaaa tgagtaaatg accattactc ctcgagaatc 1020

taaggcgctt aaggaagcat tgcgaatcgg gtgtgaaaaa gatctatttt ttgaattatt 1080

tcacacaatt tcttaatgtc aattttcgat gctcccatat tctccacggt ttaaagcaag 1140

attggtggga aagggatatt ctcgcatcga ttacaatgaa atatgggttg aaaaaaaaaa 1200

aaaaaaatta ctcaatgttg caccaaaaac cagaaaactc taagttgcgc taataaaaaa 1260

aaaagttata aacccaacat caaaccaaaa ccgtactaaa ctgtcccata tgagatttag 1320

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ctttaaataa attagtactt ctcataacga taactaaatt aaatttccct agccaagaca    1380

tacatatagt tttgattgac aaaaaaaaaa aaaactcctc tatttatagc ttgtgttttg    1440

tttcctcatt tttcacttac cattcaaacc caacact atg gca act cta ttt ctc     1495
                                        Met Ala Thr Leu Phe Leu
                                          1               5

aca atc ctc cta gcc act gtc ctc ttc ctc atc ctc cgt atc ttc tct      1543
Thr Ile Leu Leu Ala Thr Val Leu Phe Leu Ile Leu Arg Ile Phe Ser
            10                  15                  20

cac cgt cgc aac cgc agc cac aac aac cgt ctt cca ccg ggg cca aac      1591
His Arg Arg Asn Arg Ser His Asn Asn Arg Leu Pro Pro Gly Pro Asn
        25                  30                  35

cca tgg ccc atc atc gga aac ctc cct cac atg ggc act aag cct cat      1639

Pro Trp Pro Ile Ile Gly Asn Leu Pro His Met Gly Thr Lys Pro His
    40                  45                  50

cga acc ctt tcc gcc atg gtt act act tac ggc cct atc ctc cac ctc      1687
Arg Thr Leu Ser Ala Met Val Thr Thr Tyr Gly Pro Ile Leu His Leu
55                  60                  65                  70

cga cta ggg ttc gta gac gtc gtg gtc gcc gct tct aaa tcc gtg gcc      1735
Arg Leu Gly Phe Val Asp Val Val Val Ala Ala Ser Lys Ser Val Ala
                75                  80                  85

gag cag ttc ttg aaa ata cac gac gcc aat ttc gct agc cga cca cca      1783
Glu Gln Phe Leu Lys Ile His Asp Ala Asn Phe Ala Ser Arg Pro Pro
            90                  95                  100

aac tca gga gcc aaa cac atg gca tat aac tat caa gat ctt gtc ttt      1831
Asn Ser Gly Ala Lys His Met Ala Tyr Asn Tyr Gln Asp Leu Val Phe
        105                 110                 115

gca cct tac gga cac cga tgg aga ctg ttg aga aag att agt tct gtt      1879
Ala Pro Tyr Gly His Arg Trp Arg Leu Leu Arg Lys Ile Ser Ser Val
    120                 125                 130

cat cta ttt tca gct aaa gct ctc gaa gat ttc aaa cat gtt cga cag      1927
His Leu Phe Ser Ala Lys Ala Leu Glu Asp Phe Lys His Val Arg Gln
135                 140                 145                 150

gtaaaacaat tataaacggt attctcattt tctaacgcta tagctcactg gcctgtaatc    1987

atgtcatttc aatgttttga ctttttcttt atatatacat aattataatt tataattggg    2047

atttcaaacc ctatctctca ctatttcaag actagaccgg attggaattt gaacttttgt    2107

aatgaatatt agtatctgca cataaatttt atgttaaagt tgggttttct taaagtgaat    2167
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ttatatatta aaaatatata aacgattggg ttttactcaa atgaatttac ataagagcta    2227

ggtataagtg caaatatgca atactgtcat tgtcgtggat gtataaaagt atgatctaac    2287

tttgatgatg ccatggaaaa attggaaagt tcagatccag aggaaacatt gcttgaatta    2347

taaaatgtat ggaccacatt gtttccttaa atggaaggtc tcacgagttt ctcaatttca    2407

gactactgat aatatatgct attatagatt ttattttctg attatttttt ttggtttaat    2467

ttaattagag taaattttta aaaagaaata tatggttttg ttaaccgtgt tttaaaattt    2527

gatagagctt ttagatcata atcataattt tttcgtatta attgtgatta tgttggacga    2587

aaatacttaa ttagtattca agaaaactct tattctaaaa acagaaataa atgaatttta    2647

cag gaa gag gtt gga acg cta acg cgg gag cta gtg cgt gtt ggc acg      2695
    Glu Glu Val Gly Thr Leu Thr Arg Glu Leu Val Arg Val Gly Thr
      1               5                  10                  15

aaa ccc gtg aat tta ggc cag ttg gtg aac atg tgt gta gtc aac gct      2743
Lys Pro Val Asn Leu Gly Gln Leu Val Asn Met Cys Val Val Asn Ala
                 20                  25                  30

cta gga cga gag atg atc gga cgg cga ctg ttc ggc gcc gac gcc gat      2791
Leu Gly Arg Glu Met Ile Gly Arg Arg Leu Phe Gly Ala Asp Ala Asp
             35                  40                  45

cat aaa gct gac gag ttt cga tcg atg gtg acg gaa atg atg gct ctc      2839
His Lys Ala Asp Glu Phe Arg Ser Met Val Thr Glu Met Met Ala Leu
         50                  55                  60

gcc gga gta ttt aac atc gga gat ttc gtg ccg tca ctt gat tgg tta      2887
Ala Gly Val Phe Asn Ile Gly Asp Phe Val Pro Ser Leu Asp Trp Leu
     65                  70                  75

gat tta caa ggc gtc gct ggt aaa atg aaa cgg ctt cac aaa aga ttc      2935
Asp Leu Gln Gly Val Ala Gly Lys Met Lys Arg Leu His Lys Arg Phe
 80                  85                  90                  95

gac gct ttt cta tcg tcg att ttg aaa gag cac gaa atg aac ggt caa      2983
Asp Ala Phe Leu Ser Ser Ile Leu Lys Glu His Glu Met Asn Gly Gln
                100                 105                 110

gat caa aag cat aca gat atg ctt agc act tta atc tcc ctt aaa gga      3031
Asp Gln Lys His Thr Asp Met Leu Ser Thr Leu Ile Ser Leu Lys Gly
            115                 120                 125

act gat ctt gac ggt gac gga gga agc tta acg gat act gag att aaa      3079
Thr Asp Leu Asp Gly Asp Gly Gly Ser Leu Thr Asp Thr Glu Ile Lys
        130                 135                 140

gcc ttg cta ttg gtcagttttt tgacaattaa tttccttaaa aatcgtatat          3131
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Ala Leu Leu Leu
    145

aatgaaagtt agattgtttt ttttggttgt aaatacag aac atg ttc aca gct        3184
                                          Asn Met Phe Thr Ala
                                            1               5

gga act gac acg tca gca agt acg gtg gac tgg gct ata gct gaa ctt      3232
Gly Thr Asp Thr Ser Ala Ser Thr Val Asp Trp Ala Ile Ala Glu Leu
                 10                  15                  20

atc cgt cac ccg gat ata atg gtt aaa gcc caa gaa gaa ctt gat att      3280
Ile Arg His Pro Asp Ile Met Val Lys Ala Gln Glu Glu Leu Asp Ile
             25                  30                  35

gtt gtg ggc cgt gac agg cct gtt aat gaa tca gac atc gct cag ctt      3328
Val Val Gly Arg Asp Arg Pro Val Asn Glu Ser Asp Ile Ala Gln Leu
         40                  45                  50

cct tac ctt cag gtaccgttaa cccaaaccgg aatttggaat tgttttggtt         3380
Pro Tyr Leu Gln
     55

agcgagctat tgttgttaat ccggttttgg tttaaaacag gcg gtt atc aaa gag      3435
                                          Ala Val Ile Lys Glu
                                            1               5

aat ttc agg ctt cat cca cca aca cca ctc tcg tta cca cac atc gcg      3483
Asn Phe Arg Leu His Pro Pro Thr Pro Leu Ser Leu Pro His Ile Ala
                 10                  15                  20

tca gag agc tgt gag atc aac ggc tac cat atc ccg aaa gga tcg act      3531
Ser Glu Ser Cys Glu Ile Asn Gly Tyr His Ile Pro Lys Gly Ser Thr
             25                  30                  35

cta ttg acg aac ata tgg gcc ata gcc cgt gac ccg gat caa tgg tcc      3579
Leu Leu Thr Asn Ile Trp Ala Ile Ala Arg Asp Pro Asp Gln Trp Ser
         40                  45                  50

gac ccg tta gca ttt aaa ccc gag aga ttc tta ccc ggt ggt gaa aaa      3627
Asp Pro Leu Ala Phe Lys Pro Glu Arg Phe Leu Pro Gly Gly Glu Lys
     55                  60                  65

tcc ggc gtt gat gtg aaa gga agc gat ttc gag cta ata ccg ttc gga      3675
Ser Gly Val Asp Val Lys Gly Ser Asp Phe Glu Leu Ile Pro Phe Gly
 70                  75                  80                  85

gct ggg agg aga atc tgt gcc ggt tta agt tta ggg tta cgt acg att      3723
Ala Gly Arg Arg Ile Cys Ala Gly Leu Ser Leu Gly Leu Arg Thr Ile
                 90                  95                 100

cag ttt ctt acg gcg acg ttg gtt caa gga ttt gat tgg gaa tta gct      3771
Gln Phe Leu Thr Ala Thr Leu Val Gln Gly Phe Asp Trp Glu Leu Ala
            105                 110                 115
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gga gga gtt acg ccg gag aag ctg aat atg gag gag agt tat ggg ctt      3819
Gly Gly Val Thr Pro Glu Lys Leu Asn Met Glu Glu Ser Tyr Gly Leu
        120                 125                 130

aca ctg caa aga gcg gtt cct ttg gtg gta cat cct aag cca agg ttg      3867
Thr Leu Gln Arg Ala Val Pro Leu Val Val His Pro Lys Pro Arg Leu
    135                 140                 145

gct ccg aac gtt tat gga ctc ggg tcg ggt taaaatttaa ctttgcttct       3917
Ala Pro Asn Val Tyr Gly Leu Gly Ser Gly
150                 155                 160

tggacaaggt atatggcttg cacgaaaata aagttttaaa acagcgtagt ttgatccgga   3977

gttagcttta tgtaagaacg tgtaacgcca aatcaagtca ttattaaata ttgtgagttg   4037

tttgtaacct atatataaat cttgaagagg aagatttcag aaatcttgaa tatgttttag   4097

gaaaaacatt gtttttttta cagtagcgca agttgaatta aaacctattc cttacagaac   4157

caaatgcatt aataattcta gatatttttg gccaagacaa tcagattttt caatatttca   4217

tatatactag gtggaacacc accacctgca actctgcaac acatgttacg ttacacaatc   4277

acttttggcg gttttcaatt atttatataa aattgtaaat gtttgtacac agtagaaaat   4337

tagtaatagt gaattttgtt tctccgaata tgtatagcaa tatatatggc atggatcaaa   4397

ctagccgaca tcctaacttg ttcacagctt tccttttttac ttatctagtc gattaagcat   4457

cagaaagtat gttttaattt ttaaatttga aaaaggtgta cttacaagtt cgggtgttca   4517

cacggaggag agctacaata atgaaaaagc tgactcaaga agggctatag aagaaacaag   4577

agtcacggaa caagttgtca ctctcaatct ccagtacact agcttccata actctctctc   4637

tttctctctt tcttctctct ctaaaagtta tcagaataga aatctctctc tctcaacaag   4697

tctaacagtg ccatttgtat ctctgaactc caacatggct cctctggttc tctaccttct   4757

cactctcctc atggctggcc attccagtaa gaactctcac tgatcttctt caccttgtt    4817

tatggatttg gtctctcagt ctcactctcg cttacccttt cacattcagc tctggctctc   4877

tggtttaaga aacccttaat ctacaaagct tgctttcctc gcaaatgaac taccttactt   4937

atctcttatg caactcttgt tgatgatttg caaacatctt aacctctcga aacaagattt   4997

acaaatctta ctggcttcac ttacaatttt gttcccattt ttttcttctt tggtaggtgc   5057

ctcatggtgt gtgtgcaaaa cagggctgag tgactcagtg ctacaaaaga cattagacta   5117

tgcttgtgga aatggagctg actgtaaccc aactcaccca aaaggctctt gcttcaatcc   5177
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tgacaatgtt agggctcatt gcaactatgc agtcaatagc ttcttccaaa agaaaggtca 5237

agcttctgag tcttgtaact tcactggtac tgccactctt accaccaccg atcccagtaa 5297

gttttcagaa tgttaacact cttgtgatct ttagaaccct acaaaatttt gagtctcaga 5357

aagttcaagt tcaaggtctt ttggttagag tactaaagat tcaagtagag actaggcgtg 5417

agatattttt tctctgatgt gtgatttttt ggcacaggct atacaggatg tgcattccct 5477

tctagtgcta ggtacggctc tttgcttctc tacacattta ttttcttaat ggctttatct 5537

agaactttga aggataccat tttatttttt ttggacaaag aaggatagcc atttaatact 5597

acactttaat gttggattaa ctaacttatt atgcctattt aatggcctac actttaagtg 5657

gacacaagct tgatttggtt ataaaaaaag tgcactataa tcttatttta ctgaaccctt 5717

ttttctatga ttttttttact aaactttaga taacatctac aacaattcaa ttgccttttt 5777

ttggggattg tataagtttg aacctatggt tagtgtattg acttgcgcgt ctcttattgc 5837

aacggttctt tgaaaacaca ttaatgataa ataaattgaa aagtatagag atggcaattg 5897

tttcaaaagc taatctttct gcttgctaat actttacata aaaaacaaaa aattaagaag 5957

attttcaaac aatacaactt ttttaccttg tcctaacaaa ttcaactcaa atgacatgtg 6017

tttgctttaa aatagtaaca actgtaaatt catttgctct tgagacataa gtgcaagcta 6077

aagataaacg caagcaatac aattaggcct aattaagatt acgaatattg ttgtttgttt 6137

atagtggttc tagtggaagc ggtagcacca ccgtgacgcc aggcaaaaac agtccaaaag 6197

gaagcaacag catcaccaca tttcccggcg gaaacagtcc atacactggc acaccatcca 6257

ccggattatt aggaggcaat atcactgatg caactggaac cgggttgaac ccggattact 6317

caaccgaaag cagtggattt gcgctctatt actccaacaa ccttctgtta accggctttt 6377

gttctctcgt gatgatgctc tgaagaagaa tcaccgtctt cttttagttt atgcttagtc 6437

aaaaaaatat gttatttata tgttcttgtt gttttagaga taatttaatc tggatttcgg 6497

ttctttttta ctttccggtt ttaagaaaac aattatcaat gtaaaaccaa atctactatc 6557

gatcggtttg gtacgaattc ctgcagcccg ggggatcc 6595

<210> 10
<211> 150
<212> PRT
<213> Arabidopsis thaliana

<400> 10
Met Ala Thr Leu Phe Leu Thr Ile Leu Leu Ala Thr Val Leu Phe Leu
1 5 10 15

Ile Leu Arg Ile Phe Ser His Arg Arg Asn Arg Ser His Asn Asn Arg
20 25 30

Leu Pro Pro Gly Pro Asn Pro Trp Pro Ile Ile Gly Asn Leu Pro His
35 40 45

Met Gly Thr Lys Pro His Arg Thr Leu Ser Ala Met Val Thr Thr Tyr
50 55 60

Gly Pro Ile Leu His Leu Arg Leu Gly Phe Val Asp Val Val Val Ala
65 70 75 80

Ala Ser Lys Ser Val Ala Glu Gln Phe Leu Lys Ile His Asp Ala Asn
85 90 95

Phe Ala Ser Arg Pro Pro Asn Ser Gly Ala Lys His Met Ala Tyr Asn
100 105 110

Tyr Gln Asp Leu Val Phe Ala Pro Tyr Gly His Arg Trp Arg Leu Leu
115 120 125

Arg Lys Ile Ser Ser Val His Leu Phe Ser Ala Lys Ala Leu Glu Asp
130 135 140

Phe Lys His Val Arg Gln
145 150

<210> 11
<211> 147
<212> PRT
<213> Arabidopsis thaliana

<400> 11
Glu Glu Val Gly Thr Leu Thr Arg Glu Leu Val Arg Val Gly Thr Lys
1 5 10 15

Pro Val Asn Leu Gly Gln Leu Val Asn Met Cys Val Val Asn Ala Leu
20 25 30

Gly Arg Glu Met Ile Gly Arg Arg Leu Phe Gly Ala Asp Ala Asp His
35 40 45

Lys Ala Asp Glu Phe Arg Ser Met Val Thr Glu Met Met Ala Leu Ala
50 55 60

Gly Val Phe Asn Ile Gly Asp Phe Val Pro Ser Leu Asp Trp Leu Asp
65 70 75 80

```
Leu Gln Gly Val Ala Gly Lys Met Lys Arg Leu His Lys Arg Phe Asp
                 85                  90                  95

Ala Phe Leu Ser Ser Ile Leu Lys Glu His Glu Met Asn Gly Gln Asp
            100                 105                 110

Gln Lys His Thr Asp Met Leu Ser Thr Leu Ile Ser Leu Lys Gly Thr
        115                 120                 125

Asp Leu Asp Gly Asp Gly Gly Ser Leu Thr Asp Thr Glu Ile Lys Ala
    130                 135                 140

Leu Leu Leu
145
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<210> 12
<211> 57
<212> PRT
<213> Arabidopsis thaliana

<400> 12

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Asn Met Phe Thr Ala Gly Thr Asp Thr Ser Ala Ser Thr Val Asp Trp
  1               5                  10                  15

Ala Ile Ala Glu Leu Ile Arg His Pro Asp Ile Met Val Lys Ala Gln
             20                  25                  30

Glu Glu Leu Asp Ile Val Val Gly Arg Asp Arg Pro Val Asn Glu Ser
         35                  40                  45

Asp Ile Ala Gln Leu Pro Tyr Leu Gln
     50                  55
```

<210> 13
<211> 159
<212> PRT
<213> Arabidopsis thaliana

<400> 13

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Ala Val Ile Lys Glu Asn Phe Arg Leu His Pro Pro Thr Pro Leu Ser
  1               5                  10                  15

Leu Pro His Ile Ala Ser Glu Ser Cys Glu Ile Asn Gly Tyr His Ile
             20                  25                  30

Pro Lys Gly Ser Thr Leu Leu Thr Asn Ile Trp Ala Ile Ala Arg Asp
         35                  40                  45
```

```
Pro Asp Gln Trp Ser Asp Pro Leu Ala Phe Lys Pro Glu Arg Phe Leu
     50                  55                  60

Pro Gly Gly Glu Lys Ser Gly Val Asp Val Lys Gly Ser Asp Phe Glu
 65                  70                  75                  80

Leu Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Leu Ser Leu
                 85                  90                  95

Gly Leu Arg Thr Ile Gln Phe Leu Thr Ala Thr Leu Val Gln Gly Phe
            100                 105                 110

Asp Trp Glu Leu Ala Gly Gly Val Thr Pro Glu Lys Leu Asn Met Glu
        115                 120                 125

Glu Ser Tyr Gly Leu Thr Leu Gln Arg Ala Val Pro Leu Val Val His
    130                 135                 140

Pro Lys Pro Arg Leu Ala Pro Asn Val Tyr Gly Leu Gly Ser Gly
145                 150                 155


<210> 14
<211> 1748
<212> DNA
<213> Rosa hybrida

<220>
<221> CDS
<222> (22)..(1563)

<400> 14
tgtcgagaaa gaagaacagc c atg ttt ctc ata gta gtg atc acc ttc ctc   51
                       Met Phe Leu Ile Val Val Ile Thr Phe Leu
                         1               5                  10

ttc gcc gtg ttt ttg ttc cgg ctt ctt ttc tcc ggc aaa tcc caa cgc   99
Phe Ala Val Phe Leu Phe Arg Leu Leu Phe Ser Gly Lys Ser Gln Arg
                15                  20                  25

cac tcg ctc cct ctc cct cct ggc ccc aaa cca tgg ccg gtg gtt ggc   147
His Ser Leu Pro Leu Pro Pro Gly Pro Lys Pro Trp Pro Val Val Gly
            30                  35                  40

aac tta cct cac ttg ggc ccc ttc ccg cac cac tcc atc gcg gag ttg   195
Asn Leu Pro His Leu Gly Pro Phe Pro His His Ser Ile Ala Glu Leu
        45                  50                  55

gcg aag aaa cac ggg ccg ctc atg cac ctc cgc ctc ggc tac gtt gac   243
Ala Lys Lys His Gly Pro Leu Met His Leu Arg Leu Gly Tyr Val Asp
    60                  65                  70

gta gtc gtg gcg gca tca gca tcc gta gcg gcc cag ttc ttg aag act   291
```

```
Val Val Val Ala Ala Ser Ala Ser Val Ala Ala Gln Phe Leu Lys Thr
 75                  80                  85                  90

cac gac gcc aat ttc tcc agc cga ccg ccc aac tcc ggc gcc aag cac   339
His Asp Ala Asn Phe Ser Ser Arg Pro Pro Asn Ser Gly Ala Lys His
                95                 100                 105

ctc gcc tat aac tac cag gac ctc gtg ttc agg ccg tac ggt cca cgg   387
Leu Ala Tyr Asn Tyr Gln Asp Leu Val Phe Arg Pro Tyr Gly Pro Arg
            110                 115                 120

tgg cgc atg ttc cgg aag atc agc tcc gtc cat ctg ttc tcc ggc aaa   435
Trp Arg Met Phe Arg Lys Ile Ser Ser Val His Leu Phe Ser Gly Lys
        125                 130                 135

gcc ttg gat gat ctt aaa cac gtc cgg cag gag gag gta agt gtg cta   483
Ala Leu Asp Asp Leu Lys His Val Arg Gln Glu Glu Val Ser Val Leu
    140                 145                 150

gcg cat gcc ttg gca aat tca ggg tca aag gta gtg aac ctg gcg caa   531
Ala His Ala Leu Ala Asn Ser Gly Ser Lys Val Val Asn Leu Ala Gln
155                 160                 165                 170

ctg ctg aac ctg tgc acg gtc aat gct cta gga agg gtg atg gta ggg   579
Leu Leu Asn Leu Cys Thr Val Asn Ala Leu Gly Arg Val Met Val Gly
                175                 180                 185

cgg agg gtt ttc ggc gac ggc agc gga ggc gac gat ccg aag gcg gac   627
Arg Arg Val Phe Gly Asp Gly Ser Gly Gly Asp Asp Pro Lys Ala Asp
            190                 195                 200

gag ttc aaa tcg atg gtg gtg gag atg atg gtg ttg gca gga gtg ttc   675
Glu Phe Lys Ser Met Val Val Glu Met Met Val Leu Ala Gly Val Phe
        205                 210                 215

aac ata ggt gac ttc atc ccc tct ctc gaa tgg ctt gac ttg caa ggc   723
Asn Ile Gly Asp Phe Ile Pro Ser Leu Glu Trp Leu Asp Leu Gln Gly
    220                 225                 230

gtg gcg tcc aag atg aag aag ctc cac aag aga ttc gac gac ttc ttg   771
Val Ala Ser Lys Met Lys Lys Leu His Lys Arg Phe Asp Asp Phe Leu
235                 240                 245                 250

aca gcc att gtc gag gac cac aag aag ggc tcc ggc acg gcg ggg cac   819
Thr Ala Ile Val Glu Asp His Lys Lys Gly Ser Gly Thr Ala Gly His
                255                 260                 265

gtc gac atg ttg acc act ctg ctc tcg ctc aag gaa gac gcc gac ggc   867
Val Asp Met Leu Thr Thr Leu Leu Ser Leu Lys Glu Asp Ala Asp Gly
            270                 275                 280

gaa gga ggc aag ctc acc gat act gaa atc aaa gct ttg ctt ttg aac   915
Glu Gly Gly Lys Leu Thr Asp Thr Glu Ile Lys Ala Leu Leu Leu Asn
        285                 290                 295
```

```
atg ttc acg gct ggc act gat acg tca tcg agc acg gtg gaa tgg gca   963
Met Phe Thr Ala Gly Thr Asp Thr Ser Ser Ser Thr Val Glu Trp Ala
    300                 305                 310

ata gct gaa ctc att cgg cac cct cat atg cta gcg cga gtt cag aaa   1011
Ile Ala Glu Leu Ile Arg His Pro His Met Leu Ala Arg Val Gln Lys
315                 320                 325                 330

gag ctt gac gat ttt gtt ggc cat gac cga ctt gtg acc gaa tcc gac   1059
Glu Leu Asp Asp Phe Val Gly His Asp Arg Leu Val Thr Glu Ser Asp
                335                 340                 345

ata ccc aac ctc cct tac ctc caa gcc gtg atc aag gaa acg ttc cga   1107
Ile Pro Asn Leu Pro Tyr Leu Gln Ala Val Ile Lys Glu Thr Phe Arg
            350                 355                 360

ctc cac cca tcc act cct ctc tcg ttg cct cgt atg gca gcc gag agt   1155
Leu His Pro Ser Thr Pro Leu Ser Leu Pro Arg Met Ala Ala Glu Ser
        365                 370                 375

tgc gaa atc aac ggg tac cac atc ccg aaa ggc tcc aca ctc ttg gtc   1203
Cys Glu Ile Asn Gly Tyr His Ile Pro Lys Gly Ser Thr Leu Leu Val
    380                 385                 390

aat gta tgg gcc ata tcg cgt gac ccg gct gaa tgg gcc gac cca ctg   1251
Asn Val Trp Ala Ile Ser Arg Asp Pro Ala Glu Trp Ala Asp Pro Leu
395                 400                 405                 410

gag ttc aag ccc gag agg ttc ctg ccg ggg ggc gaa aag cct aat gtt   1299
Glu Phe Lys Pro Glu Arg Phe Leu Pro Gly Gly Glu Lys Pro Asn Val
                415                 420                 425

gat att aga gga aac gat ttt gaa gtc ata ccc ttc ggt gcc ggg cga   1347
Asp Ile Arg Gly Asn Asp Phe Glu Val Ile Pro Phe Gly Ala Gly Arg
            430                 435                 440

aga ata tgt gcc ggg atg agc ttg ggc ctg cgt atg gtc cat tta atg   1395
Arg Ile Cys Ala Gly Met Ser Leu Gly Leu Arg Met Val His Leu Met
        445                 450                 455

act gca aca ttg gtc cac gca ttt aat tgg gcc ttg gct gat ggg ctg   1443
Thr Ala Thr Leu Val His Ala Phe Asn Trp Ala Leu Ala Asp Gly Leu
    460                 465                 470

acc gct gag aag tta aac atg gat gaa gca tat ggg ctc act cta caa   1491
Thr Ala Glu Lys Leu Asn Met Asp Glu Ala Tyr Gly Leu Thr Leu Gln
475                 480                 485                 490

cga gct gca ccg tta atg gtg cac ccg cgc acc agg ctg gcc cca cag   1539
Arg Ala Ala Pro Leu Met Val His Pro Arg Thr Arg Leu Ala Pro Gln
                495                 500                 505

gca tat aaa act tca tca tct taa ttagagagct atgttctggg tgtgcccggt  1593
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Ala Tyr Lys Thr Ser Ser Ser
            510

ttgatgtctc catgttttct atttaggttt aaatctgtaa gataaggtga ttctatgctg 1653

aatcacaaaa gttgctatct aaattccatg tccaatgaaa acgttcttct tcccttctta 1713

taatttatga atacttatga tataggcgac agcaa                            1748


<210> 15
<211> 513
<212> PRT
<213> Rosa hybrida

<400> 15

Met Phe Leu Ile Val Val Ile Thr Phe Leu Phe Ala Val Phe Leu Phe
  1               5                  10                  15
Arg Leu Leu Phe Ser Gly Lys Ser Gln Arg His Ser Leu Pro Leu Pro
            20                  25                  30
Pro Gly Pro Lys Pro Trp Pro Val Val Gly Asn Leu Pro His Leu Gly
         35                  40                  45
Pro Phe Pro His His Ser Ile Ala Glu Leu Ala Lys Lys His Gly Pro
     50                  55                  60
Leu Met His Leu Arg Leu Gly Tyr Val Asp Val Val Val Ala Ala Ser
 65                  70                  75                  80
Ala Ser Val Ala Ala Gln Phe Leu Lys Thr His Asp Ala Asn Phe Ser
                85                  90                  95
Ser Arg Pro Pro Asn Ser Gly Ala Lys His Leu Ala Tyr Asn Tyr Gln
            100                 105                 110
Asp Leu Val Phe Arg Pro Tyr Gly Pro Arg Trp Arg Met Phe Arg Lys
        115                 120                 125
Ile Ser Ser Val His Leu Phe Ser Gly Lys Ala Leu Asp Asp Leu Lys
    130                 135                 140
His Val Arg Gln Glu Glu Val Ser Val Leu Ala His Ala Leu Ala Asn
145                 150                 155                 160
Ser Gly Ser Lys Val Val Asn Leu Ala Gln Leu Leu Asn Leu Cys Thr
                165                 170                 175
Val Asn Ala Leu Gly Arg Val Met Val Gly Arg Arg Val Phe Gly Asp
            180                 185                 190
Gly Ser Gly Gly Asp Asp Pro Lys Ala Asp Glu Phe Lys Ser Met Val
        195                 200                 205
Val Glu Met Met Val Leu Ala Gly Val Phe Asn Ile Gly Asp Phe Ile
    210                 215                 220
Pro Ser Leu Glu Trp Leu Asp Leu Gln Gly Val Ala Ser Lys Met Lys
225                 230                 235                 240
Lys Leu His Lys Arg Phe Asp Asp Phe Leu Thr Ala Ile Val Glu Asp
                245                 250                 255
His Lys Lys Gly Ser Gly Thr Ala Gly His Val Asp Met Leu Thr Thr
            260                 265                 270
Leu Leu Ser Leu Lys Glu Asp Ala Asp Gly Glu Gly Gly Lys Leu Thr
        275                 280                 285
```

```
Asp Thr Glu Ile Lys Ala Leu Leu Leu Asn Met Phe Thr Ala Gly Thr
    290                 295                 300
Asp Thr Ser Ser Ser Thr Val Glu Trp Ala Ile Ala Glu Leu Ile Arg
305                 310                 315                 320
His Pro His Met Leu Ala Arg Val Gln Lys Glu Leu Asp Asp Phe Val
                325                 330                 335
Gly His Asp Arg Leu Val Thr Glu Ser Asp Ile Pro Asn Leu Pro Tyr
            340                 345                 350
Leu Gln Ala Val Ile Lys Glu Thr Phe Arg Leu His Pro Ser Thr Pro
        355                 360                 365
Leu Ser Leu Pro Arg Met Ala Ala Glu Ser Cys Glu Ile Asn Gly Tyr
    370                 375                 380
His Ile Pro Lys Gly Ser Thr Leu Leu Val Asn Val Trp Ala Ile Ser
385                 390                 395                 400
Arg Asp Pro Ala Glu Trp Ala Asp Pro Leu Glu Phe Lys Pro Glu Arg
                405                 410                 415
Phe Leu Pro Gly Gly Glu Lys Pro Asn Val Asp Ile Arg Gly Asn Asp
            420                 425                 430
Phe Glu Val Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Met
        435                 440                 445
Ser Leu Gly Leu Arg Met Val His Leu Met Thr Ala Thr Leu Val His
    450                 455                 460
Ala Phe Asn Trp Ala Leu Ala Asp Gly Leu Thr Ala Glu Lys Leu Asn
465                 470                 475                 480
Met Asp Glu Ala Tyr Gly Leu Thr Leu Gln Arg Ala Ala Pro Leu Met
                485                 490                 495
Val His Pro Arg Thr Arg Leu Ala Pro Gln Ala Tyr Lys Thr Ser Ser
            500                 505                 510
Ser
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<210> 16
<211> 1660
<212> DNA
<213> Chrysanthemum

<220>
<221> CDS
<222> (4)..(1530)

<400> 16

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aaa atg acc att tta gct ttc gta ttt tac gcc ctc atc ctc ggg tca   48
    Met Thr Ile Leu Ala Phe Val Phe Tyr Ala Leu Ile Leu Gly Ser
      1               5                  10                  15

gta ctc tat gta ttt ctt aac tta agt tca cgt aaa tcc gcc aga ctc   96
Val Leu Tyr Val Phe Leu Asn Leu Ser Ser Arg Lys Ser Ala Arg Leu
                 20                  25                  30

cca ccc ggg cca aca cca tgg cct ata gtc ggg aac tta cca cac ctt   144
Pro Pro Gly Pro Thr Pro Trp Pro Ile Val Gly Asn Leu Pro His Leu
             35                  40                  45
```

```
ggc cca atc cca cac cac gca ctc gcg gcc tta gcc aag aag tac ggg   192
Gly Pro Ile Pro His His Ala Leu Ala Ala Leu Ala Lys Lys Tyr Gly
         50                  55                  60

cca ttg atg cac ctg cgg ctc ggg tgt gtg gac gtg gtt gtg gcc gcg   240
Pro Leu Met His Leu Arg Leu Gly Cys Val Asp Val Val Val Ala Ala
     65                  70                  75

tct gct tcc gta gct gca cag ttt tta aaa gtt cac gac gca aat ttt   288
Ser Ala Ser Val Ala Ala Gln Phe Leu Lys Val His Asp Ala Asn Phe
 80                  85                  90                  95

gct agt agg ccg cca aat tct ggc gcg aaa cat gtg gcg tat aat tat   336
Ala Ser Arg Pro Pro Asn Ser Gly Ala Lys His Val Ala Tyr Asn Tyr
                100                 105                 110

cag gat ctt gtg ttt gca cct tat ggt cca agg tgg cgt ttg tta agg   384
Gln Asp Leu Val Phe Ala Pro Tyr Gly Pro Arg Trp Arg Leu Leu Arg
            115                 120                 125

aag att tgt tcg gtc cat ttg ttt tct gct aaa gca ctt gat gat ttt   432
Lys Ile Cys Ser Val His Leu Phe Ser Ala Lys Ala Leu Asp Asp Phe
        130                 135                 140

cgt cat gtt cga cag gag gag gta gca gtc cta acc cgc gta cta ctg   480
Arg His Val Arg Gln Glu Glu Val Ala Val Leu Thr Arg Val Leu Leu
    145                 150                 155

agt gct gga aac tca ccg gta cag ctt ggc caa cta ctt aac gtg tgt   528
Ser Ala Gly Asn Ser Pro Val Gln Leu Gly Gln Leu Leu Asn Val Cys
160                 165                 170                 175

gcc aca aac gcc tta gca cgg gta atg tta ggt agg aga gtt ttc gga   576
Ala Thr Asn Ala Leu Ala Arg Val Met Leu Gly Arg Arg Val Phe Gly
                180                 185                 190

gac gga att gac agg tca gcc aat gag ttc aaa gat atg gta gta gag   624
Asp Gly Ile Asp Arg Ser Ala Asn Glu Phe Lys Asp Met Val Val Glu
            195                 200                 205

tta atg gta tta gca gga gaa ttt aac ctt ggt gac ttt att cct gta   672
Leu Met Val Leu Ala Gly Glu Phe Asn Leu Gly Asp Phe Ile Pro Val
        210                 215                 220

ctt gac cta ttc gac cta caa ggc att act aaa aaa atg aag aag ctt   720
Leu Asp Leu Phe Asp Leu Gln Gly Ile Thr Lys Lys Met Lys Lys Leu
    225                 230                 235

cat gtt cgg ttc gat tca ttt ctt agt aag atc gtt gag gag cat aaa   768
His Val Arg Phe Asp Ser Phe Leu Ser Lys Ile Val Glu Glu His Lys
240                 245                 250                 255

acg gca cct ggt ggg ttg ggt cat act gat ttg ctg agc acg ttg att   816
```

```
Thr Ala Pro Gly Gly Leu Gly His Thr Asp Leu Leu Ser Thr Leu Ile
                260                 265                 270

tca ctt aaa gat gat gct gat att gaa ggt ggg aag ctt aca gat act   864
Ser Leu Lys Asp Asp Ala Asp Ile Glu Gly Gly Lys Leu Thr Asp Thr
            275                 280                 285

gaa atc aaa gct ttg ctt ctg aat tta ttc gct gcg gga aca gac aca   912
Glu Ile Lys Ala Leu Leu Leu Asn Leu Phe Ala Ala Gly Thr Asp Thr
        290                 295                 300

tcc tct agt aca gta gaa tgg gca ata gcc gaa ctc att cgt cat cca   960
Ser Ser Ser Thr Val Glu Trp Ala Ile Ala Glu Leu Ile Arg His Pro
    305                 310                 315

caa ata tta aaa caa gcc cga gaa gag ata gac gct gta gtt ggt caa   1008
Gln Ile Leu Lys Gln Ala Arg Glu Glu Ile Asp Ala Val Val Gly Gln
320                 325                 330                 335

gac cgg ctt gta aca gaa ttg gac ttg agc caa cta aca tac ctc cag   1056
Asp Arg Leu Val Thr Glu Leu Asp Leu Ser Gln Leu Thr Tyr Leu Gln
                340                 345                 350

gct ctt gtg aaa gag gtg ttt agg ctc cac cct tca acg cca ctc tcc   1104
Ala Leu Val Lys Glu Val Phe Arg Leu His Pro Ser Thr Pro Leu Ser
            355                 360                 365

tta cca aga ata tca tcc gag agt tgt gag gtc gat ggg tat tat atc   1152
Leu Pro Arg Ile Ser Ser Glu Ser Cys Glu Val Asp Gly Tyr Tyr Ile
        370                 375                 380

cct aag gga tcc aca ctc ctc gtt aac gtg tgg gcc att gcg cga gac   1200
Pro Lys Gly Ser Thr Leu Leu Val Asn Val Trp Ala Ile Ala Arg Asp
    385                 390                 395

cca aaa atg tgg gcg gat cct ctt gaa ttt agg cct tct cgg ttt tta   1248
Pro Lys Met Trp Ala Asp Pro Leu Glu Phe Arg Pro Ser Arg Phe Leu
400                 405                 410                 415

ccc ggg gga gaa aag ccc ggt gct gat gtt agg gga aat gat ttt gaa   1296
Pro Gly Gly Glu Lys Pro Gly Ala Asp Val Arg Gly Asn Asp Phe Glu
                420                 425                 430

gtt ata cca ttt ggg gca gga cga agg att tgt gcg ggt atg agc cta   1344
Val Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Met Ser Leu
            435                 440                 445

ggc ttg aga atg gtc cag ttg ctc att gca aca ttg gtc caa act ttt   1392
Gly Leu Arg Met Val Gln Leu Leu Ile Ala Thr Leu Val Gln Thr Phe
        450                 455                 460

gat tgg gaa ctg gct aac ggg tta gag ccg gag atg ctc aac atg gaa   1440
Asp Trp Glu Leu Ala Asn Gly Leu Glu Pro Glu Met Leu Asn Met Glu
    465                 470                 475
```

```
gaa gcg tat gga ttg acc ctt caa cgg gct gca ccc ttg atg gtt cac   1488
Glu Ala Tyr Gly Leu Thr Leu Gln Arg Ala Ala Pro Leu Met Val His
480                 485                 490                 495

ccg aag ccg agg tta gct ccc cac gta tat gaa agt att taa           1530
Pro Lys Pro Arg Leu Ala Pro His Val Tyr Glu Ser Ile
                500                 505

ggactagttt ctcttttgcc tttttgtttc gcaaaggtta atgaataaac gatttcatga 1590

ctcagatagt tatgtaaaca attgtgtttg ctgtttatat atttatctat ttttctagaa 1650

caaaaaaaaa                                                         1660
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<210> 17
<211> 508
<212> PRT
<213> Chrysanthemum

<400> 17

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Met Thr Ile Leu Ala Phe Val Phe Tyr Ala Leu Ile Leu Gly Ser Val
  1               5                  10                  15
Leu Tyr Val Phe Leu Asn Leu Ser Ser Arg Lys Ser Ala Arg Leu Pro
             20                  25                  30
Pro Gly Pro Thr Pro Trp Pro Ile Val Gly Asn Leu Pro His Leu Gly
         35                  40                  45
Pro Ile Pro His His Ala Leu Ala Ala Leu Ala Lys Lys Tyr Gly Pro
     50                  55                  60
Leu Met His Leu Arg Leu Gly Cys Val Asp Val Val Val Ala Ala Ser
 65                  70                  75                  80
Ala Ser Val Ala Ala Gln Phe Leu Lys Val His Asp Ala Asn Phe Ala
                 85                  90                  95
Ser Arg Pro Pro Asn Ser Gly Ala Lys His Val Ala Tyr Asn Tyr Gln
            100                 105                 110
Asp Leu Val Phe Ala Pro Tyr Gly Pro Arg Trp Arg Leu Leu Arg Lys
        115                 120                 125
Ile Cys Ser Val His Leu Phe Ser Ala Lys Ala Leu Asp Asp Phe Arg
    130                 135                 140
His Val Arg Gln Glu Glu Val Ala Val Leu Thr Arg Val Leu Leu Ser
145                 150                 155                 160
Ala Gly Asn Ser Pro Val Gln Leu Gly Gln Leu Leu Asn Val Cys Ala
                165                 170                 175
Thr Asn Ala Leu Ala Arg Val Met Leu Gly Arg Arg Val Phe Gly Asp
            180                 185                 190
Gly Ile Asp Arg Ser Ala Asn Glu Phe Lys Asp Met Val Val Glu Leu
        195                 200                 205
Met Val Leu Ala Gly Glu Phe Asn Leu Gly Asp Phe Ile Pro Val Leu
    210                 215                 220
Asp Leu Phe Asp Leu Gln Gly Ile Thr Lys Lys Met Lys Lys Leu His
225                 230                 235                 240
Val Arg Phe Asp Ser Phe Leu Ser Lys Ile Val Glu Glu His Lys Thr
                245                 250                 255
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Ala Pro Gly Gly Leu Gly His Thr Asp Leu Leu Ser Thr Leu Ile Ser
            260                 265                 270
Leu Lys Asp Asp Ala Asp Ile Glu Gly Gly Lys Leu Thr Asp Thr Glu
        275                 280                 285
Ile Lys Ala Leu Leu Leu Asn Leu Phe Ala Ala Gly Thr Asp Thr Ser
    290                 295                 300
Ser Ser Thr Val Glu Trp Ala Ile Ala Glu Leu Ile Arg His Pro Gln
305                 310                 315                 320
Ile Leu Lys Gln Ala Arg Glu Glu Ile Asp Ala Val Val Gly Gln Asp
                325                 330                 335
Arg Leu Val Thr Glu Leu Asp Leu Ser Gln Leu Thr Tyr Leu Gln Ala
            340                 345                 350
Leu Val Lys Glu Val Phe Arg Leu His Pro Ser Thr Pro Leu Ser Leu
        355                 360                 365
Pro Arg Ile Ser Ser Glu Ser Cys Glu Val Asp Gly Tyr Tyr Ile Pro
    370                 375                 380
Lys Gly Ser Thr Leu Leu Val Asn Val Trp Ala Ile Ala Arg Asp Pro
385                 390                 395                 400
Lys Met Trp Ala Asp Pro Leu Glu Phe Arg Pro Ser Arg Phe Leu Pro
                405                 410                 415
Gly Gly Glu Lys Pro Gly Ala Asp Val Arg Gly Asn Asp Phe Glu Val
            420                 425                 430
Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Met Ser Leu Gly
        435                 440                 445
Leu Arg Met Val Gln Leu Leu Ile Ala Thr Leu Val Gln Thr Phe Asp
    450                 455                 460
Trp Glu Leu Ala Asn Gly Leu Glu Pro Glu Met Leu Asn Met Glu Glu
465                 470                 475                 480
Ala Tyr Gly Leu Thr Leu Gln Arg Ala Ala Pro Leu Met Val His Pro
                485                 490                 495
Lys Pro Arg Leu Ala Pro His Val Tyr Glu Ser Ile
            500                 505
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<210> 18
<211> 1815
<212> DNA
<213> Torenia

<220>
<221> CDS
<222> (107)..(1633)

<400> 18
ctaaattaat taataaatac acacacgacg agatgtatgt aatgtaatgt aatattatta 60

catacatcat caccgaatac gcacgctact accactgcga ttagcc atg agt ccc 115
                                                    Met Ser Pro
                                                      1

tta gcc ttg atg atc ata agt acc tta tta ggg ttt ctc cta tac cac 163
Leu Ala Leu Met Ile Ile Ser Thr Leu Leu Gly Phe Leu Leu Tyr His
      5   10   15

```
tct ctt cgc tta cta ctc ttc tcc ggc caa ggt cgc cga cta cta cca   211
Ser Leu Arg Leu Leu Leu Phe Ser Gly Gln Gly Arg Arg Leu Leu Pro
 20                  25                  30                  35

cca ggt cca cgc ccg tgg ccg ctg gtg gga aat ctc ccg cac tta ggc   259
Pro Gly Pro Arg Pro Trp Pro Leu Val Gly Asn Leu Pro His Leu Gly
                 40                  45                  50

ccg aag cca cac gcc tcc atg gcc gag ctc gcg cga gcc tac gga ccc   307
Pro Lys Pro His Ala Ser Met Ala Glu Leu Ala Arg Ala Tyr Gly Pro
             55                  60                  65

ctc atg cac cta aag atg ggg ttc gtc cac gtc gtg gtg gct tcg tcg   355
Leu Met His Leu Lys Met Gly Phe Val His Val Val Val Ala Ser Ser
         70                  75                  80

gcg agc gcg gcg gag cag tgc ctg agg gtt cac gac gcg aat ttc ttg   403
Ala Ser Ala Ala Glu Gln Cys Leu Arg Val His Asp Ala Asn Phe Leu
     85                  90                  95

agc agg cca ccc aac tcc ggc gcc aag cac gtc gct tac aac tac gag   451
Ser Arg Pro Pro Asn Ser Gly Ala Lys His Val Ala Tyr Asn Tyr Glu
100                 105                 110                 115

gac ttg gtt ttc aga ccg tac ggt ccc aag tgg agg ctg ttg agg aag   499
Asp Leu Val Phe Arg Pro Tyr Gly Pro Lys Trp Arg Leu Leu Arg Lys
                120                 125                 130

ata tgc gct cag cat att ttc tcc gtc aag gct atg gat gac ttc agg   547
Ile Cys Ala Gln His Ile Phe Ser Val Lys Ala Met Asp Asp Phe Arg
            135                 140                 145

cgc gtc aga gag gaa gag gtg gcc atc ctg agt cgc gct cta gca ggc   595
Arg Val Arg Glu Glu Glu Val Ala Ile Leu Ser Arg Ala Leu Ala Gly
        150                 155                 160

aaa agg gcc gta ccc ata ggc caa atg ctc aac gtg tgc gcc aca aac   643
Lys Arg Ala Val Pro Ile Gly Gln Met Leu Asn Val Cys Ala Thr Asn
    165                 170                 175

gcc cta tct cgc gtc atg atg ggg cgg cgc gtg gtg ggc cac gcg gat   691
Ala Leu Ser Arg Val Met Met Gly Arg Arg Val Val Gly His Ala Asp
180                 185                 190                 195

gga acc aac gac gcc aag gcg gag gag ttc aaa gcc atg gtc gtc gag   739
Gly Thr Asn Asp Ala Lys Ala Glu Glu Phe Lys Ala Met Val Val Glu
                200                 205                 210

ctc atg gtc ctc tcc ggc gtc ttc aac atc ggt gat ttc atc ccc ttc   787
Leu Met Val Leu Ser Gly Val Phe Asn Ile Gly Asp Phe Ile Pro Phe
            215                 220                 225

ctc gag cct ctc gac ttg cag gga gtg gct tcc aag atg aag aaa ctc   835
```

```
Leu Glu Pro Leu Asp Leu Gln Gly Val Ala Ser Lys Met Lys Lys Leu
        230                 235                 240

cac gcg cgg ttc gat gca ttc ttg acc gag att gta cga gag cgt tgt   883
His Ala Arg Phe Asp Ala Phe Leu Thr Glu Ile Val Arg Glu Arg Cys
    245                 250                 255

cat ggg cag atc aac aac agt ggt gct cat cag gat gat ttg ctt agc   931
His Gly Gln Ile Asn Asn Ser Gly Ala His Gln Asp Asp Leu Leu Ser
260                 265                 270                 275

acg ttg att tcg ttc aaa ggg ctt gac gat ggc gat ggt tcc agg ctc   979
Thr Leu Ile Ser Phe Lys Gly Leu Asp Asp Gly Asp Gly Ser Arg Leu
                280                 285                 290

act gac aca gaa atc aag gcg ctg ctc ttg aac ctt ttg gac acg acg   1027
Thr Asp Thr Glu Ile Lys Ala Leu Leu Leu Asn Leu Leu Asp Thr Thr
            295                 300                 305

tcg agc acg gtg gaa tgg gcc gta gcc gaa ctc cta cgc cac cct aag   1075
Ser Ser Thr Val Glu Trp Ala Val Ala Glu Leu Leu Arg His Pro Lys
        310                 315                 320

aca tta gcc caa gtc cgg caa gag ctc gac tcg gtc gtg ggt aag aac   1123
Thr Leu Ala Gln Val Arg Gln Glu Leu Asp Ser Val Val Gly Lys Asn
    325                 330                 335

agg ctc gtg tcc gag acc gat ctg aat cag ctg ccc tat cta caa gct   1171
Arg Leu Val Ser Glu Thr Asp Leu Asn Gln Leu Pro Tyr Leu Gln Ala
340                 345                 350                 355

gtc gtc aaa gaa act ttc cgc ctc cat cct ccg acg ccg ctc tct cta   1219
Val Val Lys Glu Thr Phe Arg Leu His Pro Pro Thr Pro Leu Ser Leu
                360                 365                 370

ccg aga ctc gcg gaa gat gat tgc gag atc gac gga tac ctc atc ccc   1267
Pro Arg Leu Ala Glu Asp Asp Cys Glu Ile Asp Gly Tyr Leu Ile Pro
            375                 380                 385

aag ggc tcg acc ctt ctg gtg aac gtt tgg gcc ata gcc cgc gat ccc   1315
Lys Gly Ser Thr Leu Leu Val Asn Val Trp Ala Ile Ala Arg Asp Pro
        390                 395                 400

aag gtt tgg gcc gat ccg ttg gag ttt agg ccc gaa cga ttc ttg acg   1363
Lys Val Trp Ala Asp Pro Leu Glu Phe Arg Pro Glu Arg Phe Leu Thr
    405                 410                 415

ggc gga gaa aag gcc gac gtc gat gtc aag ggg aac gat ttc gaa gtg   1411
Gly Gly Glu Lys Ala Asp Val Asp Val Lys Gly Asn Asp Phe Glu Val
420                 425                 430                 435

ata ccg ttc ggg gcg ggt cgt agg atc tgc gct ggc gtt ggc ttg gga   1459
Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Val Gly Leu Gly
                440                 445                 450
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ata cgt atg gtc caa ctg ttg acg gcg agt ttg atc cat gca ttc gat   1507
Ile Arg Met Val Gln Leu Leu Thr Ala Ser Leu Ile His Ala Phe Asp
            455                 460                 465

ctg gac ctt gct aat ggg ctt ttg gcc caa aat ctg aac atg gaa gaa   1555
Leu Asp Leu Ala Asn Gly Leu Leu Ala Gln Asn Leu Asn Met Glu Glu
        470                 475                 480

gca tat ggg ctt acg cta caa cgg gct gag cct ttg ttg gtc cac cct   1603
Ala Tyr Gly Leu Thr Leu Gln Arg Ala Glu Pro Leu Leu Val His Pro
    485                 490                 495

agg ccg cgg ttg gcc act cat gtc tat taa ttaaattagg cctaaactac     1653
Arg Pro Arg Leu Ala Thr His Val Tyr
500                 505

gatgaatgac ccatttaacg ttaataagag ttttcaattt atgtgagttt gcatggtatg 1713

gtatggtatg gtgcttgtaa taaattgtat ctgttaggtg tgttcattga tgataaatct 1773

agtttgtact gctgctcaaa aaaaaaaaaa aaaaaaaaaa aa                    1815


<210> 19
<211> 508
<212> PRT
<213> Torenia

<400> 19
Met Ser Pro Leu Ala Leu Met Ile Ile Ser Thr Leu Leu Gly Phe Leu
  1               5                  10                  15
Leu Tyr His Ser Leu Arg Leu Leu Leu Phe Ser Gly Gln Gly Arg Arg
             20                  25                  30
Leu Leu Pro Pro Gly Pro Arg Pro Trp Pro Leu Val Gly Asn Leu Pro
         35                  40                  45
His Leu Gly Pro Lys Pro His Ala Ser Met Ala Glu Leu Ala Arg Ala
     50                  55                  60
Tyr Gly Pro Leu Met His Leu Lys Met Gly Phe Val His Val Val Val
 65                  70                  75                  80
Ala Ser Ser Ala Ser Ala Ala Glu Gln Cys Leu Arg Val His Asp Ala
                 85                  90                  95
Asn Phe Leu Ser Arg Pro Pro Asn Ser Gly Ala Lys His Val Ala Tyr
            100                 105                 110
Asn Tyr Glu Asp Leu Val Phe Arg Pro Tyr Gly Pro Lys Trp Arg Leu
        115                 120                 125
Leu Arg Lys Ile Cys Ala Gln His Ile Phe Ser Val Lys Ala Met Asp
    130                 135                 140
Asp Phe Arg Arg Val Arg Glu Glu Glu Val Ala Ile Leu Ser Arg Ala
145                 150                 155                 160
Leu Ala Gly Lys Arg Ala Val Pro Ile Gly Gln Met Leu Asn Val Cys
                165                 170                 175
Ala Thr Asn Ala Leu Ser Arg Val Met Met Gly Arg Arg Val Val Gly
            180                 185                 190
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```
His Ala Asp Gly Thr Asn Asp Ala Lys Ala Glu Glu Phe Lys Ala Met
        195                 200                 205
Val Val Glu Leu Met Val Leu Ser Gly Val Phe Asn Ile Gly Asp Phe
    210                 215                 220
Ile Pro Phe Leu Glu Pro Leu Asp Leu Gln Gly Val Ala Ser Lys Met
225                 230                 235                 240
Lys Lys Leu His Ala Arg Phe Asp Ala Phe Leu Thr Glu Ile Val Arg
                245                 250                 255
Glu Arg Cys His Gly Gln Ile Asn Asn Ser Gly Ala His Gln Asp Asp
            260                 265                 270
Leu Leu Ser Thr Leu Ile Ser Phe Lys Gly Leu Asp Asp Gly Asp Gly
        275                 280                 285
Ser Arg Leu Thr Asp Thr Glu Ile Lys Ala Leu Leu Leu Asn Leu Leu
    290                 295                 300
Asp Thr Thr Ser Ser Thr Val Glu Trp Ala Val Ala Glu Leu Leu Arg
305                 310                 315                 320
His Pro Lys Thr Leu Ala Gln Val Arg Gln Glu Leu Asp Ser Val Val
                325                 330                 335
Gly Lys Asn Arg Leu Val Ser Glu Thr Asp Leu Asn Gln Leu Pro Tyr
            340                 345                 350
Leu Gln Ala Val Val Lys Glu Thr Phe Arg Leu His Pro Pro Thr Pro
        355                 360                 365
Leu Ser Leu Pro Arg Leu Ala Glu Asp Asp Cys Glu Ile Asp Gly Tyr
    370                 375                 380
Leu Ile Pro Lys Gly Ser Thr Leu Leu Val Asn Val Trp Ala Ile Ala
385                 390                 395                 400
Arg Asp Pro Lys Val Trp Ala Asp Pro Leu Glu Phe Arg Pro Glu Arg
                405                 410                 415
Phe Leu Thr Gly Gly Glu Lys Ala Asp Val Asp Val Lys Gly Asn Asp
            420                 425                 430
Phe Glu Val Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Val
        435                 440                 445
Gly Leu Gly Ile Arg Met Val Gln Leu Leu Thr Ala Ser Leu Ile His
    450                 455                 460
Ala Phe Asp Leu Asp Leu Ala Asn Gly Leu Leu Ala Gln Asn Leu Asn
465                 470                 475                 480
Met Glu Glu Ala Tyr Gly Leu Thr Leu Gln Arg Ala Glu Pro Leu Leu
                485                 490                 495
Val His Pro Arg Pro Arg Leu Ala Thr His Val Tyr
            500                 505
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<210> 20
<211> 1824
<212> DNA
<213> Jap. Morning Glory

<220>
<221> CDS
<222> (2)..(1555)

<400> 20
g agc tta acc tta att ttc tgc act tta gtt ttt gca atc ttt cta tat 49

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  Ser Leu Thr Leu Ile Phe Cys Thr Leu Val Phe Ala Ile Phe Leu Tyr
    1               5                  10                  15

ttt ctt att ctc agg gtg aaa cag cgt tac cct tta cct ctc cca ccc   97
Phe Leu Ile Leu Arg Val Lys Gln Arg Tyr Pro Leu Pro Leu Pro Pro
             20                  25                  30

gga cca aaa cca tgg ccg gtg tta gga aac ctt ccc cac ctg ggc aag   145
Gly Pro Lys Pro Trp Pro Val Leu Gly Asn Leu Pro His Leu Gly Lys
         35                  40                  45

aag cct cac cag tcg att gcg gcc atg gct gag agg tac ggc ccc ctc   193
Lys Pro His Gln Ser Ile Ala Ala Met Ala Glu Arg Tyr Gly Pro Leu
     50                  55                  60

atg cac ctc cgc cta gga ttc gtg gac gtg gtt gtg gcc gcc tcc gcc   241
Met His Leu Arg Leu Gly Phe Val Asp Val Val Val Ala Ala Ser Ala
 65                  70                  75                  80

gcc gtg gcc gct cag ttc ttg aaa gtt cac gac tcg aac ttc tcc aac   289
Ala Val Ala Ala Gln Phe Leu Lys Val His Asp Ser Asn Phe Ser Asn
                 85                  90                  95

cgg ccg ccg aac tcc ggc gcg gaa cac att gct tat aac tat caa gac   337
Arg Pro Pro Asn Ser Gly Ala Glu His Ile Ala Tyr Asn Tyr Gln Asp
            100                 105                 110

ctc gtc ttc gcg ccc tac ggc ccg cgg tgg cgc atg ctt agg aag atc   385
Leu Val Phe Ala Pro Tyr Gly Pro Arg Trp Arg Met Leu Arg Lys Ile
        115                 120                 125

acc tcc gtg cat ctc ttc tcg gcc aag gcg ttg gat gac ttc tgc cat   433
Thr Ser Val His Leu Phe Ser Ala Lys Ala Leu Asp Asp Phe Cys His
    130                 135                 140

gtt cgc cag gaa gag gtt gca act ctg aca cgc agt cta gca agt gca   481
Val Arg Gln Glu Glu Val Ala Thr Leu Thr Arg Ser Leu Ala Ser Ala
145                 150                 155                 160

ggc aaa act cca gta aaa cta ggg cag tta cta aac gtg tgc acc acg   529
Gly Lys Thr Pro Val Lys Leu Gly Gln Leu Leu Asn Val Cys Thr Thr
                165                 170                 175

aac gcc cta gct cgt gta atg cta ggg cgg aag gtc ttt aat gac gga   577
Asn Ala Leu Ala Arg Val Met Leu Gly Arg Lys Val Phe Asn Asp Gly
            180                 185                 190

ggt agc aag agc gac cca aag gcg gag gag ttc aag tcg atg gtg gag   625
Gly Ser Lys Ser Asp Pro Lys Ala Glu Glu Phe Lys Ser Met Val Glu
        195                 200                 205

gag atg atg gtg ttg gcc gga agt ttt aac atc ggc gat ttc att ccg   673
Glu Met Met Val Leu Ala Gly Ser Phe Asn Ile Gly Asp Phe Ile Pro
    210                 215                 220
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gtc ttg ggt tgg ttt gac gtt cag ggt atc gta ggg aag atg aag aaa   721
Val Leu Gly Trp Phe Asp Val Gln Gly Ile Val Gly Lys Met Lys Lys
225                 230                 235                 240

cta cac gcg cgt ttt gat gcg ttc ttg aac acc att cta gag gaa cac   769
Leu His Ala Arg Phe Asp Ala Phe Leu Asn Thr Ile Leu Glu Glu His
                245                 250                 255

aaa tgt gtc aac aat caa cac acg acg ttg tcg aaa gat gtg gac ttc   817
Lys Cys Val Asn Asn Gln His Thr Thr Leu Ser Lys Asp Val Asp Phe
            260                 265                 270

ttg agc acc cta att agg ctc aaa gat aat ggg gct gat atg gat tgt   865
Leu Ser Thr Leu Ile Arg Leu Lys Asp Asn Gly Ala Asp Met Asp Cys
        275                 280                 285

gaa gag gga aaa ctc acc gac act gaa att aag gct ttg ctc ttg aac   913
Glu Glu Gly Lys Leu Thr Asp Thr Glu Ile Lys Ala Leu Leu Leu Asn
    290                 295                 300

ctg ttc aca gct ggg act gat aca tca tct agc act gtg gag tgg gca   961
Leu Phe Thr Ala Gly Thr Asp Thr Ser Ser Ser Thr Val Glu Trp Ala
305                 310                 315                 320

atc gca gaa cta cta cgc aac cca aaa atc tta aac caa gca caa caa   1009
Ile Ala Glu Leu Leu Arg Asn Pro Lys Ile Leu Asn Gln Ala Gln Gln
                325                 330                 335

gag ctt gac tta gtg gtg ggt caa aat cag cta gtc aca gaa tct gac   1057
Glu Leu Asp Leu Val Val Gly Gln Asn Gln Leu Val Thr Glu Ser Asp
            340                 345                 350

tta acc gat cta cct ttc ctg caa gca ata gtg aag gag acc ttc agg   1105
Leu Thr Asp Leu Pro Phe Leu Gln Ala Ile Val Lys Glu Thr Phe Arg
        355                 360                 365

cta cac cca tcc acc cca ctc tct ctt cca aga atg gga gct cag ggt   1153
Leu His Pro Ser Thr Pro Leu Ser Leu Pro Arg Met Gly Ala Gln Gly
    370                 375                 380

tgc gag atc aat ggc tac ttc atc ccc aaa ggc gca acg ctt ttg gtc   1201
Cys Glu Ile Asn Gly Tyr Phe Ile Pro Lys Gly Ala Thr Leu Leu Val
385                 390                 395                 400

aac gtt tgg gcc ata gct cgt gat ccc aat gtg tgg aca aat cct ctt   1249
Asn Val Trp Ala Ile Ala Arg Asp Pro Asn Val Trp Thr Asn Pro Leu
                405                 410                 415

gag ttc aac cca cac cga ttc ttg cct ggt gga gaa aag ccc aac gtg   1297
Glu Phe Asn Pro His Arg Phe Leu Pro Gly Gly Glu Lys Pro Asn Val
            420                 425                 430

gat att aaa ggg aat gac ttt gaa gtg att cct ttt gga gcc ggg cgt   1345
```

```
Asp Ile Lys Gly Asn Asp Phe Glu Val Ile Pro Phe Gly Ala Gly Arg
        435                 440                 445

aga ata tgc tct ggg atg agt ttg ggg ata agg atg gtt cac ctg ttg   1393
Arg Ile Cys Ser Gly Met Ser Leu Gly Ile Arg Met Val His Leu Leu
    450                 455                 460

gtt gca act ttg gtg cat gct ttt gat tgg gat ttg gtg aat gga caa   1441
Val Ala Thr Leu Val His Ala Phe Asp Trp Asp Leu Val Asn Gly Gln
465                 470                 475                 480

tct gta gag acg ctc aat atg gag gaa gct tat ggt ctc acc ctt caa   1489
Ser Val Glu Thr Leu Asn Met Glu Glu Ala Tyr Gly Leu Thr Leu Gln
                485                 490                 495

cga gct gtt cct ttg atg ttg cat cca aag ccc aga tta caa cca cat   1537
Arg Ala Val Pro Leu Met Leu His Pro Lys Pro Arg Leu Gln Pro His
            500                 505                 510

ctc tat act ctc aat taa attgcaattt gattttggtg attatacaat          1585
Leu Tyr Thr Leu Asn
        515

tataatcgag ggacatagga tccccattta tttatattca gttataagag acttccaaca 1645

aaggtctagc tttcgacctt aaaagttgta aaagaggtcc tacatatgta aaagcccgcc 1705

aaaggaaaac tggttgtatt caattccgct aggccttgtc cgaaagacct catgaagact 1765

acaaaggtca tatataatgg taaacccagt gtatttgttg taaaaaaaaa aaaaaaaaa  1824


<210> 21
<211> 517
<212> PRT
<213> Jap. Morning Glory

<400> 21
Ser Leu Thr Leu Ile Phe Cys Thr Leu Val Phe Ala Ile Phe Leu Tyr
  1               5                  10                  15
Phe Leu Ile Leu Arg Val Lys Gln Arg Tyr Pro Leu Pro Leu Pro Pro
             20                  25                  30
Gly Pro Lys Pro Trp Pro Val Leu Gly Asn Leu Pro His Leu Gly Lys
         35                  40                  45
Lys Pro His Gln Ser Ile Ala Ala Met Ala Glu Arg Tyr Gly Pro Leu
     50                  55                  60
Met His Leu Arg Leu Gly Phe Val Asp Val Val Val Ala Ala Ser Ala
 65                  70                  75                  80
Ala Val Ala Ala Gln Phe Leu Lys Val His Asp Ser Asn Phe Ser Asn
                 85                  90                  95
Arg Pro Pro Asn Ser Gly Ala Glu His Ile Ala Tyr Asn Tyr Gln Asp
            100                 105                 110
Leu Val Phe Ala Pro Tyr Gly Pro Arg Trp Arg Met Leu Arg Lys Ile
        115                 120                 125
```

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Thr Ser Val His Leu Phe Ser Ala Lys Ala Leu Asp Asp Phe Cys His
    130                 135                 140
Val Arg Gln Glu Glu Val Ala Thr Leu Thr Arg Ser Leu Ala Ser Ala
145                 150                 155                 160
Gly Lys Thr Pro Val Lys Leu Gly Gln Leu Leu Asn Val Cys Thr Thr
                165                 170                 175
Asn Ala Leu Ala Arg Val Met Leu Gly Arg Lys Val Phe Asn Asp Gly
            180                 185                 190
Gly Ser Lys Ser Asp Pro Lys Ala Glu Glu Phe Lys Ser Met Val Glu
        195                 200                 205
Glu Met Met Val Leu Ala Gly Ser Phe Asn Ile Gly Asp Phe Ile Pro
    210                 215                 220
Val Leu Gly Trp Phe Asp Val Gln Gly Ile Val Gly Lys Met Lys Lys
225                 230                 235                 240
Leu His Ala Arg Phe Asp Ala Phe Leu Asn Thr Ile Leu Glu Glu His
                245                 250                 255
Lys Cys Val Asn Asn Gln His Thr Thr Leu Ser Lys Asp Val Asp Phe
            260                 265                 270
Leu Ser Thr Leu Ile Arg Leu Lys Asp Asn Gly Ala Asp Met Asp Cys
        275                 280                 285
Glu Glu Gly Lys Leu Thr Asp Thr Glu Ile Lys Ala Leu Leu Leu Asn
    290                 295                 300
Leu Phe Thr Ala Gly Thr Asp Thr Ser Ser Ser Thr Val Glu Trp Ala
305                 310                 315                 320
Ile Ala Glu Leu Leu Arg Asn Pro Lys Ile Leu Asn Gln Ala Gln Gln
                325                 330                 335
Glu Leu Asp Leu Val Val Gly Gln Asn Gln Leu Val Thr Glu Ser Asp
            340                 345                 350
Leu Thr Asp Leu Pro Phe Leu Gln Ala Ile Val Lys Glu Thr Phe Arg
        355                 360                 365
Leu His Pro Ser Thr Pro Leu Ser Leu Pro Arg Met Gly Ala Gln Gly
    370                 375                 380
Cys Glu Ile Asn Gly Tyr Phe Ile Pro Lys Gly Ala Thr Leu Leu Val
385                 390                 395                 400
Asn Val Trp Ala Ile Ala Arg Asp Pro Asn Val Trp Thr Asn Pro Leu
                405                 410                 415
Glu Phe Asn Pro His Arg Phe Leu Pro Gly Gly Glu Lys Pro Asn Val
            420                 425                 430
Asp Ile Lys Gly Asn Asp Phe Glu Val Ile Pro Phe Gly Ala Gly Arg
        435                 440                 445
Arg Ile Cys Ser Gly Met Ser Leu Gly Ile Arg Met Val His Leu Leu
    450                 455                 460
Val Ala Thr Leu Val His Ala Phe Asp Trp Asp Leu Val Asn Gly Gln
465                 470                 475                 480
Ser Val Glu Thr Leu Asn Met Glu Glu Ala Tyr Gly Leu Thr Leu Gln
                485                 490                 495
Arg Ala Val Pro Leu Met Leu His Pro Lys Pro Arg Leu Gln Pro His
            500                 505                 510
Leu Tyr Thr Leu Asn
        515
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<210> 22

<211> 1667
<212> DNA
<213> Gentian

<220>
<221> CDS
<222> (1)..(1431)

<400> 22
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ccc atc ctc gga aac atc ccc cat ctc ggc tcc aaa ccg cac caa aca   48
Pro Ile Leu Gly Asn Ile Pro His Leu Gly Ser Lys Pro His Gln Thr
  1               5                  10                  15

ctc gcg gaa atg gcg aaa acc tac ggt ccg ctc atg cac ttg aag ttc   96
Leu Ala Glu Met Ala Lys Thr Tyr Gly Pro Leu Met His Leu Lys Phe
             20                  25                  30

ggg ctt aag gac gcg gtg gtg gcg tcg tct gcg tcg gtg gca gag cag   144
Gly Leu Lys Asp Ala Val Val Ala Ser Ser Ala Ser Val Ala Glu Gln
         35                  40                  45

ttt ctg aag aaa cac gac gtg aat ttc tcg aac cgg ccg cca aac tcc   192
Phe Leu Lys Lys His Asp Val Asn Phe Ser Asn Arg Pro Pro Asn Ser
     50                  55                  60

ggg gcc aaa cat ata gct tat aac tat cag gac ctg gta ttc gct ccc   240
Gly Ala Lys His Ile Ala Tyr Asn Tyr Gln Asp Leu Val Phe Ala Pro
 65                  70                  75                  80

tat gga ccc cgg tgg cgg ttg ctt agg aaa atc tgt tcc gtc cat ctt   288
Tyr Gly Pro Arg Trp Arg Leu Leu Arg Lys Ile Cys Ser Val His Leu
                 85                  90                  95

ttc tcg tct aag gcc ttg gat gac ttt cag cat gtt cga cat gag gag   336
Phe Ser Ser Lys Ala Leu Asp Asp Phe Gln His Val Arg His Glu Glu
            100                 105                 110

ata tgc atc ctt ata cga gca ata gcg agt ggc ggt cat gct ccg gtg   384
Ile Cys Ile Leu Ile Arg Ala Ile Ala Ser Gly Gly His Ala Pro Val
        115                 120                 125

aat tta ggc aag tta tta gga gtg tgc aca acc aat gcc ctg gca aga   432
Asn Leu Gly Lys Leu Leu Gly Val Cys Thr Thr Asn Ala Leu Ala Arg
    130                 135                 140

gtg atg ctt gga aga aga gta ttc gaa ggc gac ggc ggc gag aat ccg   480
Val Met Leu Gly Arg Arg Val Phe Glu Gly Asp Gly Gly Glu Asn Pro
145                 150                 155                 160

cat gcc gac gag ttt aaa tca atg gtg gtg gag att atg gtg tta gcc   528
His Ala Asp Glu Phe Lys Ser Met Val Val Glu Ile Met Val Leu Ala
                165                 170                 175

ggt gca ttc aac ttg ggt gat ttc atc ccg gtt cta gat tgg ttc gat   576
```

```
Gly Ala Phe Asn Leu Gly Asp Phe Ile Pro Val Leu Asp Trp Phe Asp
            180                 185                 190

ttg caa gga att gct ggt aaa atg aag aaa ctt cat gcc cgt ttc gac   624
Leu Gln Gly Ile Ala Gly Lys Met Lys Lys Leu His Ala Arg Phe Asp
        195                 200                 205

aag ttt tta aat ggg atc cta gaa gat cgt aaa tct aac ggc tct aat   672
Lys Phe Leu Asn Gly Ile Leu Glu Asp Arg Lys Ser Asn Gly Ser Asn
    210                 215                 220

gga gct gaa caa tac gtg gac ttg ctc agt gtg ttg atc tct ctt caa   720
Gly Ala Glu Gln Tyr Val Asp Leu Leu Ser Val Leu Ile Ser Leu Gln
225                 230                 235                 240

gat agt aat atc gac ggt ggt gac gaa gga acc aaa ctc aca gat act   768
Asp Ser Asn Ile Asp Gly Gly Asp Glu Gly Thr Lys Leu Thr Asp Thr
                245                 250                 255

gaa atc aaa gct ctc ctt ttg aac ttg ttc ata gcc gga aca gac act   816
Glu Ile Lys Ala Leu Leu Leu Asn Leu Phe Ile Ala Gly Thr Asp Thr
            260                 265                 270

tca tca agt act gta gaa tgg gcc atg gca gaa cta atc cga aac cca   864
Ser Ser Ser Thr Val Glu Trp Ala Met Ala Glu Leu Ile Arg Asn Pro
        275                 280                 285

aag tta cta gtc caa gcc caa gaa gag cta gac aga gta gtc ggg ccg   912
Lys Leu Leu Val Gln Ala Gln Glu Glu Leu Asp Arg Val Val Gly Pro
    290                 295                 300

aac cga ttc gta acc gaa tct gat ctt cct caa ctg aca ttc ctt caa   960
Asn Arg Phe Val Thr Glu Ser Asp Leu Pro Gln Leu Thr Phe Leu Gln
305                 310                 315                 320

gcc gtc atc aaa gag act ttc agg ctt cat cca tcc acc cca ctc tct   1008
Ala Val Ile Lys Glu Thr Phe Arg Leu His Pro Ser Thr Pro Leu Ser
                325                 330                 335

ctt cca cga atg gcg gcg gag gac tgt gag atc aat ggg tat tat gtc   1056
Leu Pro Arg Met Ala Ala Glu Asp Cys Glu Ile Asn Gly Tyr Tyr Val
            340                 345                 350

tca gaa ggt tcg aca ttg ctc gtc aat gtg tgg gcc ata gct cgt gat   1104
Ser Glu Gly Ser Thr Leu Leu Val Asn Val Trp Ala Ile Ala Arg Asp
        355                 360                 365

cca aat gcg tgg gcc aat cca cta gat ttc aac ccg act cgt ttc ttg   1152
Pro Asn Ala Trp Ala Asn Pro Leu Asp Phe Asn Pro Thr Arg Phe Leu
    370                 375                 380

gcc ggt gga gag aag cct aat gtt gat gtt aaa ggg aat gat ttt gaa   1200
Ala Gly Gly Glu Lys Pro Asn Val Asp Val Lys Gly Asn Asp Phe Glu
385                 390                 395                 400
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```
gtg ata cct ttc ggt gct ggg cgc agg ata tgt gcc gga atg agc tta   1248
Val Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Met Ser Leu
                405                 410                 415

ggt ata cgg atg gtt caa cta gta acg gct tcg tta gtt cat tcg ttt   1296
Gly Ile Arg Met Val Gln Leu Val Thr Ala Ser Leu Val His Ser Phe
            420                 425                 430

gat tgg gct ttg ttg gat gga ctt aaa ccc gag aag ctt gac atg gag   1344
Asp Trp Ala Leu Leu Asp Gly Leu Lys Pro Glu Lys Leu Asp Met Glu
        435                 440                 445

gaa ggt tat gga cta acg ctt caa cga gct tca cct tta atc gtc cat   1392
Glu Gly Tyr Gly Leu Thr Leu Gln Arg Ala Ser Pro Leu Ile Val His
    450                 455                 460

cca aag ccg agg ctc tcg gct caa gtt tat tgt atg taa caagtttgtg    1441
Pro Lys Pro Arg Leu Ser Ala Gln Val Tyr Cys Met
465                 470                 475

aagccagtct gatttcagtt ggatttgtag ttattttatg atcatttggt attttatttt 1501

gtatttcggt tgaatacaat aaagggaagg tggatcgtct gctgtataat agcgacgttt 1561

taacgtgttg tgatagtacc gtgttttact aaaacgatgt cgtttgattt tttatagtat 1621

taaaaaaata aacagctgga ttttgaacca aaaaaaaaaa aaaaaa                1667
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<210> 23
<211> 476
<212> PRT
<213> Gentian

<400> 23

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Pro Ile Leu Gly Asn Ile Pro His Leu Gly Ser Lys Pro His Gln Thr
  1               5                  10                  15
Leu Ala Glu Met Ala Lys Thr Tyr Gly Pro Leu Met His Leu Lys Phe
             20                  25                  30
Gly Leu Lys Asp Ala Val Val Ala Ser Ser Ala Ser Val Ala Glu Gln
         35                  40                  45
Phe Leu Lys Lys His Asp Val Asn Phe Ser Asn Arg Pro Pro Asn Ser
     50                  55                  60
Gly Ala Lys His Ile Ala Tyr Asn Tyr Gln Asp Leu Val Phe Ala Pro
 65                  70                  75                  80
Tyr Gly Pro Arg Trp Arg Leu Leu Arg Lys Ile Cys Ser Val His Leu
                 85                  90                  95
Phe Ser Ser Lys Ala Leu Asp Asp Phe Gln His Val Arg His Glu Glu
            100                 105                 110
Ile Cys Ile Leu Ile Arg Ala Ile Ala Ser Gly Gly His Ala Pro Val
        115                 120                 125
Asn Leu Gly Lys Leu Leu Gly Val Cys Thr Thr Asn Ala Leu Ala Arg
    130                 135                 140
```

```
Val Met Leu Gly Arg Arg Val Phe Glu Gly Asp Gly Gly Glu Asn Pro
145                 150                 155                 160
His Ala Asp Glu Phe Lys Ser Met Val Val Glu Ile Met Val Leu Ala
                165                 170                 175
Gly Ala Phe Asn Leu Gly Asp Phe Ile Pro Val Leu Asp Trp Phe Asp
            180                 185                 190
Leu Gln Gly Ile Ala Gly Lys Met Lys Lys Leu His Ala Arg Phe Asp
        195                 200                 205
Lys Phe Leu Asn Gly Ile Leu Glu Asp Arg Lys Ser Asn Gly Ser Asn
    210                 215                 220
Gly Ala Glu Gln Tyr Val Asp Leu Leu Ser Val Leu Ile Ser Leu Gln
225                 230                 235                 240
Asp Ser Asn Ile Asp Gly Gly Asp Glu Gly Thr Lys Leu Thr Asp Thr
                245                 250                 255
Glu Ile Lys Ala Leu Leu Leu Asn Leu Phe Ile Ala Gly Thr Asp Thr
            260                 265                 270
Ser Ser Ser Thr Val Glu Trp Ala Met Ala Glu Leu Ile Arg Asn Pro
        275                 280                 285
Lys Leu Leu Val Gln Ala Gln Glu Glu Leu Asp Arg Val Val Gly Pro
    290                 295                 300
Asn Arg Phe Val Thr Glu Ser Asp Leu Pro Gln Leu Thr Phe Leu Gln
305                 310                 315                 320
Ala Val Ile Lys Glu Thr Phe Arg Leu His Pro Ser Thr Pro Leu Ser
                325                 330                 335
Leu Pro Arg Met Ala Ala Glu Asp Cys Glu Ile Asn Gly Tyr Tyr Val
            340                 345                 350
Ser Glu Gly Ser Thr Leu Leu Val Asn Val Trp Ala Ile Ala Arg Asp
        355                 360                 365
Pro Asn Ala Trp Ala Asn Pro Leu Asp Phe Asn Pro Thr Arg Phe Leu
    370                 375                 380
Ala Gly Gly Glu Lys Pro Asn Val Asp Val Lys Gly Asn Asp Phe Glu
385                 390                 395                 400
Val Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Met Ser Leu
                405                 410                 415
Gly Ile Arg Met Val Gln Leu Val Thr Ala Ser Leu Val His Ser Phe
            420                 425                 430
Asp Trp Ala Leu Leu Asp Gly Leu Lys Pro Glu Lys Leu Asp Met Glu
        435                 440                 445
Glu Gly Tyr Gly Leu Thr Leu Gln Arg Ala Ser Pro Leu Ile Val His
    450                 455                 460
Pro Lys Pro Arg Leu Ser Ala Gln Val Tyr Cys Met
465                 470                 475
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<210> 24
<211> 1214
<212> DNA
<213> Lisianthus

<220>
<221> CDS
<222> (2)..(1093)

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t cgc atc ctc acg cga tct ata gcg agt gct ggg gaa aat ccg att aac 49
  Arg Ile Leu Thr Arg Ser Ile Ala Ser Ala Gly Glu Asn Pro Ile Asn
    1   5   10   15

tta ggt caa tta ctc ggg gtg tgt acc aca aat gct ctg gcg aga gtg   97
Leu Gly Gln Leu Leu Gly Val Cys Thr Thr Asn Ala Leu Ala Arg Val
             20   25   30

atg ctt gga agg agg gta ttc ggc gat ggg agc ggc ggc gta gat cct   145
Met Leu Gly Arg Arg Val Phe Gly Asp Gly Ser Gly Gly Val Asp Pro
         35   40   45

cag gcg gac gag ttc aaa tcc atg gtg gtg gaa atc atg gtg ttg gcc   193
Gln Ala Asp Glu Phe Lys Ser Met Val Val Glu Ile Met Val Leu Ala
     50   55   60

ggc gcg ttt aat cta ggt gat ttt att ccc gct ctt gat tgg ttc gat   241
Gly Ala Phe Asn Leu Gly Asp Phe Ile Pro Ala Leu Asp Trp Phe Asp
 65   70   75   80

ctg cag gga att acg gca aaa atg aag aaa gtt cac gct cgt ttc gat   289
Leu Gln Gly Ile Thr Ala Lys Met Lys Lys Val His Ala Arg Phe Asp
                 85   90   95

gcg ttc tta gac gcg atc ctt gag gag cac aaa tcc aac ggc tct cgc   337
Ala Phe Leu Asp Ala Ile Leu Glu Glu His Lys Ser Asn Gly Ser Arg
            100   105   110

gga gct aag caa cac gtt gac ttg ctg agt atg ttg atc tcc ctt caa   385
Gly Ala Lys Gln His Val Asp Leu Leu Ser Met Leu Ile Ser Leu Gln
        115   120   125

gat aat aac att gat ggt gaa agt ggc gcc aaa ctc act gat aca gaa   433
Asp Asn Asn Ile Asp Gly Glu Ser Gly Ala Lys Leu Thr Asp Thr Glu
    130   135   140

atc aaa gct ttg ctt ctg aac ttg ttc acg gct gga aca gac acg tca   481
Ile Lys Ala Leu Leu Leu Asn Leu Phe Thr Ala Gly Thr Asp Thr Ser
145   150   155   160

tca agt act gtg gag tgg gca atc gca gag cta atc cga aac cca gaa   529
Ser Ser Thr Val Glu Trp Ala Ile Ala Glu Leu Ile Arg Asn Pro Glu
                165   170   175

gta ttg gtt caa gcc caa caa gag ctc gat aga gta gtt ggg cca agt   577
Val Leu Val Gln Ala Gln Gln Glu Leu Asp Arg Val Val Gly Pro Ser
            180   185   190

cgt ctt gtg acc gaa tct gat ctg cct caa ttg gca ttc ctt caa gct   625
Arg Leu Val Thr Glu Ser Asp Leu Pro Gln Leu Ala Phe Leu Gln Ala
        195   200   205

gtc atc aaa gag act ttc aga ctt cat cca tcc act cca ctc tct ctt   673

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Val Ile Lys Glu Thr Phe Arg Leu His Pro Ser Thr Pro Leu Ser Leu
    210                 215                 220

cca cga atg gct tca gag ggt tgt gaa atc aat gga tac tcc atc cca   721
Pro Arg Met Ala Ser Glu Gly Cys Glu Ile Asn Gly Tyr Ser Ile Pro
225                 230                 235                 240

aag ggt tcg aca ttg ctc gtt aac gta tgg tcc ata gcc cgt gat cct   769
Lys Gly Ser Thr Leu Leu Val Asn Val Trp Ser Ile Ala Arg Asp Pro
                245                 250                 255

agt ata tgg gcc gac cca tta gaa ttt agg ccg gca cgt ttc ttg ccc   817
Ser Ile Trp Ala Asp Pro Leu Glu Phe Arg Pro Ala Arg Phe Leu Pro
            260                 265                 270

ggc gga gaa aag ccc aat gtt gat gtg aga ggc aat gat ttt gag gtc   865
Gly Gly Glu Lys Pro Asn Val Asp Val Arg Gly Asn Asp Phe Glu Val
        275                 280                 285

ata cca ttt ggt gct gga cgt agg ata tgt gct gga atg agc ttg ggt   913
Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Met Ser Leu Gly
    290                 295                 300

tta aga atg gtt caa ctt tcg aca gct act ttg gtt cat tcg ttt aat   961
Leu Arg Met Val Gln Leu Ser Thr Ala Thr Leu Val His Ser Phe Asn
305                 310                 315                 320

tgg gat ttg ctg aat ggg atg agc cca gat aaa ctt gac atg gaa gaa  1009
Trp Asp Leu Leu Asn Gly Met Ser Pro Asp Lys Leu Asp Met Glu Glu
                325                 330                 335

gct tat ggg ctt aca ttg caa cgg gct tca cct ttg att gtc cac cca  1057
Ala Tyr Gly Leu Thr Leu Gln Arg Ala Ser Pro Leu Ile Val His Pro
            340                 345                 350

aag ccc agg ctt gct agc tct atg tat gtt aaa tga aattatgctg       1103
Lys Pro Arg Leu Ala Ser Ser Met Tyr Val Lys
        355                 360

tgcgaataat tccttattta tagcaggaaa tgtcatcttg aattatgtgt aatgttcttc 1163

taactttcga tggaagtgca aaacaagttt tattaaaaaa aaaaaaaaaa a          1214


<210> 25
<211> 363
<212> PRT
<213> Lisianthus

<400> 25
Arg Ile Leu Thr Arg Ser Ile Ala Ser Ala Gly Glu Asn Pro Ile Asn
  1               5                  10                  15
Leu Gly Gln Leu Leu Gly Val Cys Thr Thr Asn Ala Leu Ala Arg Val
             20                  25                  30
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Met Leu Gly Arg Arg Val Phe Gly Asp Gly Ser Gly Gly Val Asp Pro
         35                  40                  45
Gln Ala Asp Glu Phe Lys Ser Met Val Val Glu Ile Met Val Leu Ala
     50                  55                  60
Gly Ala Phe Asn Leu Gly Asp Phe Ile Pro Ala Leu Asp Trp Phe Asp
 65                  70                  75                  80
Leu Gln Gly Ile Thr Ala Lys Met Lys Lys Val His Ala Arg Phe Asp
                 85                  90                  95
Ala Phe Leu Asp Ala Ile Leu Glu Glu His Lys Ser Asn Gly Ser Arg
            100                 105                 110
Gly Ala Lys Gln His Val Asp Leu Leu Ser Met Leu Ile Ser Leu Gln
        115                 120                 125
Asp Asn Asn Ile Asp Gly Glu Ser Gly Ala Lys Leu Thr Asp Thr Glu
    130                 135                 140
Ile Lys Ala Leu Leu Leu Asn Leu Phe Thr Ala Gly Thr Asp Thr Ser
145                 150                 155                 160
Ser Ser Thr Val Glu Trp Ala Ile Ala Glu Leu Ile Arg Asn Pro Glu
                165                 170                 175
Val Leu Val Gln Ala Gln Gln Glu Leu Asp Arg Val Val Gly Pro Ser
            180                 185                 190
Arg Leu Val Thr Glu Ser Asp Leu Pro Gln Leu Ala Phe Leu Gln Ala
        195                 200                 205
Val Ile Lys Glu Thr Phe Arg Leu His Pro Ser Thr Pro Leu Ser Leu
    210                 215                 220
Pro Arg Met Ala Ser Glu Gly Cys Glu Ile Asn Gly Tyr Ser Ile Pro
225                 230                 235                 240
Lys Gly Ser Thr Leu Leu Val Asn Val Trp Ser Ile Ala Arg Asp Pro
                245                 250                 255
Ser Ile Trp Ala Asp Pro Leu Glu Phe Arg Pro Ala Arg Phe Leu Pro
            260                 265                 270
Gly Gly Glu Lys Pro Asn Val Asp Val Arg Gly Asn Asp Phe Glu Val
        275                 280                 285
Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys Ala Gly Met Ser Leu Gly
    290                 295                 300
Leu Arg Met Val Gln Leu Ser Thr Ala Thr Leu Val His Ser Phe Asn
305                 310                 315                 320
Trp Asp Leu Leu Asn Gly Met Ser Pro Asp Lys Leu Asp Met Glu Glu
                325                 330                 335
Ala Tyr Gly Leu Thr Leu Gln Arg Ala Ser Pro Leu Ile Val His Pro
            340                 345                 350
Lys Pro Arg Leu Ala Ser Ser Met Tyr Val Lys
        355                 360
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<210> 26
<211> 1757
<212> DNA
<213> Petunia sp.

<220>
<221> CDS
<222> (35)..(1525)

<400> 26
ccgttgctgt cgagaaaaca gaaagaagag aaaa atg gac tac gtg aat att ttg 55
Met Asp Tyr Val Asn Ile Leu
1 5

ctg gga ctg ttt ttc act tgg ttc ttg gtg aat gga ctc atg tca ctt 103
Leu Gly Leu Phe Phe Thr Trp Phe Leu Val Asn Gly Leu Met Ser Leu
10 15 20

cga aga aga aaa atc tct aag aaa ctt cca cca ggt cca ttt cct ttg 151
Arg Arg Arg Lys Ile Ser Lys Lys Leu Pro Pro Gly Pro Phe Pro Leu
25 30 35

cct atc atc gga aat ctt cac tta ctt ggt aat cat cct cac aaa tca 199
Pro Ile Ile Gly Asn Leu His Leu Leu Gly Asn His Pro His Lys Ser
40 45 50 55

ctt gct caa ctt gca aaa att cat ggt cct att atg aat ctc aaa tta 247
Leu Ala Gln Leu Ala Lys Ile His Gly Pro Ile Met Asn Leu Lys Leu
60 65 70

ggc caa cta aac aca gtg gtc att tca tca tca gtc gtg gca aga gaa 295
Gly Gln Leu Asn Thr Val Val Ile Ser Ser Ser Val Val Ala Arg Glu
75 80 85

gtc ttg caa aaa caa gac tta aca ttt tcc aat agg ttt gtc ccg gac 343
Val Leu Gln Lys Gln Asp Leu Thr Phe Ser Asn Arg Phe Val Pro Asp
90 95 100

gta gtc cat gtc cga aat cac tcc gat ttt tct gtt gtt tgg tta cca 391
Val Val His Val Arg Asn His Ser Asp Phe Ser Val Val Trp Leu Pro
105 110 115

gtc aat tct cga tgg aaa acg ctt cgc aaa atc atg aac tct agc atc 439
Val Asn Ser Arg Trp Lys Thr Leu Arg Lys Ile Met Asn Ser Ser Ile
120 125 130 135

ttt tct ggt aac aag ctt gat ggt aat caa cat ctg agg tct aaa aag 487
Phe Ser Gly Asn Lys Leu Asp Gly Asn Gln His Leu Arg Ser Lys Lys
140 145 150

gtc caa gag tta att gat tat tgt caa aag tgt gcc aag aat ggc gaa 535
Val Gln Glu Leu Ile Asp Tyr Cys Gln Lys Cys Ala Lys Asn Gly Glu
155 160 165

gca gtg gat ata gga aga gca act ttt gga act act ttg aat ttg cta 583
Ala Val Asp Ile Gly Arg Ala Thr Phe Gly Thr Thr Leu Asn Leu Leu
170 175 180

tcc aac acc att ttc tct aaa gat ttg act aat ccg ttt tct gat tct 631
Ser Asn Thr Ile Phe Ser Lys Asp Leu Thr Asn Pro Phe Ser Asp Ser
185 190 195

gct aaa gag ttt aag gaa ttg gtt tgg aac att atg gtt gag gct gga 679

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Ala Lys Glu Phe Lys Glu Leu Val Trp Asn Ile Met Val Glu Ala Gly
200                 205                 210                 215

aaa ccc aat ttg gtg gac tac ttt cct ttc ctt gag aaa att gat ccg   727
Lys Pro Asn Leu Val Asp Tyr Phe Pro Phe Leu Glu Lys Ile Asp Pro
                220                 225                 230

caa ggt ata aag cga cgc atg act aat aat ttt act aag ttt ctt ggc   775
Gln Gly Ile Lys Arg Arg Met Thr Asn Asn Phe Thr Lys Phe Leu Gly
            235                 240                 245

ctt atc agc ggt ttg att gat gac cgg tta aag gaa agg aat cta agg   823
Leu Ile Ser Gly Leu Ile Asp Asp Arg Leu Lys Glu Arg Asn Leu Arg
        250                 255                 260

gac aat gca aat att gat gtt tta gac gcc ctt ctc aac att agc caa   871
Asp Asn Ala Asn Ile Asp Val Leu Asp Ala Leu Leu Asn Ile Ser Gln
    265                 270                 275

gag aac cca gaa gag att gac agg aat caa atc gag cag ttg tgt ctg   919
Glu Asn Pro Glu Glu Ile Asp Arg Asn Gln Ile Glu Gln Leu Cys Leu
280                 285                 290                 295

gac ttg ttt gca gca ggg act gat act aca tcg aat acc ttg gag tgg   967
Asp Leu Phe Ala Ala Gly Thr Asp Thr Thr Ser Asn Thr Leu Glu Trp
                300                 305                 310

gca atg gca gaa cta ctt cag aat cca cac aca ttg cag aaa gca caa   1015
Ala Met Ala Glu Leu Leu Gln Asn Pro His Thr Leu Gln Lys Ala Gln
            315                 320                 325

gaa gaa ctt gca caa gtc att ggt aaa ggc aaa caa gta gaa gaa gca   1063
Glu Glu Leu Ala Gln Val Ile Gly Lys Gly Lys Gln Val Glu Glu Ala
        330                 335                 340

gat gtt gga cga cta cct tac ttg cga tgc ata gtg aaa gaa acc tta   1111
Asp Val Gly Arg Leu Pro Tyr Leu Arg Cys Ile Val Lys Glu Thr Leu
    345                 350                 355

cga ata cac cca gcg gct cct ctc tta att cca cgt aaa gtg gag gaa   1159
Arg Ile His Pro Ala Ala Pro Leu Leu Ile Pro Arg Lys Val Glu Glu
360                 365                 370                 375

gac gtt gag ttg tct acc tat att att cca aag gat tca caa gtt cta   1207
Asp Val Glu Leu Ser Thr Tyr Ile Ile Pro Lys Asp Ser Gln Val Leu
                380                 385                 390

gtg aac gta tgg gca att gga cgc aac tct gat cta tgg gaa aat cct   1255
Val Asn Val Trp Ala Ile Gly Arg Asn Ser Asp Leu Trp Glu Asn Pro
            395                 400                 405

ttg gtc ttt aag cca gaa agg ttt tgg gag tca gaa ata gat atc cga   1303
Leu Val Phe Lys Pro Glu Arg Phe Trp Glu Ser Glu Ile Asp Ile Arg
        410                 415                 420
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ggt cga gat ttt gaa ctc att cca ttt ggt gct ggt cga aga att tgc   1351
Gly Arg Asp Phe Glu Leu Ile Pro Phe Gly Ala Gly Arg Arg Ile Cys
    425                 430                 435

cct gga ttg cct ttg gct atg agg atg att cca gta gca cta ggt tca   1399
Pro Gly Leu Pro Leu Ala Met Arg Met Ile Pro Val Ala Leu Gly Ser
440                 445                 450                 455

ttg cta aac tca ttt aat tgg aaa cta tat ggt gga att gca cct aaa   1447
Leu Leu Asn Ser Phe Asn Trp Lys Leu Tyr Gly Gly Ile Ala Pro Lys
                460                 465                 470

gat ttg gac atg cag gaa aag ttt ggc att acc ttg gcg aaa gcc caa   1495
Asp Leu Asp Met Gln Glu Lys Phe Gly Ile Thr Leu Ala Lys Ala Gln
            475                 480                 485

cct ctg cta gct atc cca act ccc ctg tag ctatagggat aaattaagtt     1545
Pro Leu Leu Ala Ile Pro Thr Pro Leu
        490                 495

gaggttttaa gttactagta gattctattg cagctatagg atttctttca ccatcacgta 1605

tgctttaccg ttggatgatg gaaagaaata tctatagctt tgggtttgtt tagtttgcac 1665

ataaaaattg aatgaatgga ataccatgga gttataagaa ataataagac tatgattctt 1725

accctacttg aacaatgaca tggctatttc ac                               1757
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<210> 27
<211> 496
<212> PRT
<213> Petunia sp.

<400> 27

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Met Asp Tyr Val Asn Ile Leu Leu Gly Leu Phe Phe Thr Trp Phe Leu
  1               5                  10                  15
Val Asn Gly Leu Met Ser Leu Arg Arg Arg Lys Ile Ser Lys Lys Leu
             20                  25                  30
Pro Pro Gly Pro Phe Pro Leu Pro Ile Ile Gly Asn Leu His Leu Leu
         35                  40                  45
Gly Asn His Pro His Lys Ser Leu Ala Gln Leu Ala Lys Ile His Gly
     50                  55                  60
Pro Ile Met Asn Leu Lys Leu Gly Gln Leu Asn Thr Val Val Ile Ser
 65                  70                  75                  80
Ser Ser Val Val Ala Arg Glu Val Leu Gln Lys Gln Asp Leu Thr Phe
                 85                  90                  95
Ser Asn Arg Phe Val Pro Asp Val Val His Val Arg Asn His Ser Asp
            100                 105                 110
Phe Ser Val Val Trp Leu Pro Val Asn Ser Arg Trp Lys Thr Leu Arg
        115                 120                 125
Lys Ile Met Asn Ser Ser Ile Phe Ser Gly Asn Lys Leu Asp Gly Asn
    130                 135                 140
```

```
Gln His Leu Arg Ser Lys Lys Val Gln Glu Leu Ile Asp Tyr Cys Gln
145                 150                 155                 160
Lys Cys Ala Lys Asn Gly Glu Ala Val Asp Ile Gly Arg Ala Thr Phe
                165                 170                 175
Gly Thr Thr Leu Asn Leu Leu Ser Asn Thr Ile Phe Ser Lys Asp Leu
            180                 185                 190
Thr Asn Pro Phe Ser Asp Ser Ala Lys Glu Phe Lys Glu Leu Val Trp
        195                 200                 205
Asn Ile Met Val Glu Ala Gly Lys Pro Asn Leu Val Asp Tyr Phe Pro
    210                 215                 220
Phe Leu Glu Lys Ile Asp Pro Gln Gly Ile Lys Arg Arg Met Thr Asn
225                 230                 235                 240
Asn Phe Thr Lys Phe Leu Gly Leu Ile Ser Gly Leu Ile Asp Asp Arg
                245                 250                 255
Leu Lys Glu Arg Asn Leu Arg Asp Asn Ala Asn Ile Asp Val Leu Asp
            260                 265                 270
Ala Leu Leu Asn Ile Ser Gln Glu Asn Pro Glu Glu Ile Asp Arg Asn
        275                 280                 285
Gln Ile Glu Gln Leu Cys Leu Asp Leu Phe Ala Ala Gly Thr Asp Thr
    290                 295                 300
Thr Ser Asn Thr Leu Glu Trp Ala Met Ala Glu Leu Leu Gln Asn Pro
305                 310                 315                 320
His Thr Leu Gln Lys Ala Gln Glu Glu Leu Ala Gln Val Ile Gly Lys
                325                 330                 335
Gly Lys Gln Val Glu Glu Ala Asp Val Gly Arg Leu Pro Tyr Leu Arg
            340                 345                 350
Cys Ile Val Lys Glu Thr Leu Arg Ile His Pro Ala Ala Pro Leu Leu
        355                 360                 365
Ile Pro Arg Lys Val Glu Glu Asp Val Glu Leu Ser Thr Tyr Ile Ile
    370                 375                 380
Pro Lys Asp Ser Gln Val Leu Val Asn Val Trp Ala Ile Gly Arg Asn
385                 390                 395                 400
Ser Asp Leu Trp Glu Asn Pro Leu Val Phe Lys Pro Glu Arg Phe Trp
                405                 410                 415
Glu Ser Glu Ile Asp Ile Arg Gly Arg Asp Phe Glu Leu Ile Pro Phe
            420                 425                 430
Gly Ala Gly Arg Arg Ile Cys Pro Gly Leu Pro Leu Ala Met Arg Met
        435                 440                 445
Ile Pro Val Ala Leu Gly Ser Leu Leu Asn Ser Phe Asn Trp Lys Leu
    450                 455                 460
Tyr Gly Gly Ile Ala Pro Lys Asp Leu Asp Met Gln Glu Lys Phe Gly
465                 470                 475                 480
Ile Thr Leu Ala Lys Ala Gln Pro Leu Leu Ala Ile Pro Thr Pro Leu
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